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# NAIROBI MUNICIPALITY

Kenya

# EIGHTEENTH
# ANNUAL REPORT
# of the
# Medical Officer of Health

1947

Printed by D. L. Patel Press, Ltd., Nairobi

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Town Hall,
NAIROBI.
May 1st, 1948.

The Worshipful the Mayor, Aldermen and Councillors,
Municipal Council of Nairobi.

Your Worship, Aldermen and Councillors,

I have the honour to present to you my Annual Report on the sanitary circumstances, sanitary administration, vital statistics and other matters of health nature, of the Municipality of Nairobi for the Year 1947, as required by the ''Local Government (Municipalities) Ordinance, 1928,'' ''The Medical Officers of Health Rules, Section 2 (12.d.)''

A. T. G. THOMAS, M.D., B.S., D.P.H.,
MEDICAL OFFICER OF HEALTH.

MUNICIPAL COUNCIL OF NAIROBI
Kenya Colony,

With the Compliments

of

The Medical Officer of Health.

Public Health Department,
Town Hall,
Nairobi,
Kenya.

NAIROBI MUNICIPALITY

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# General Remarks

The year covered by this report has shown a continuation of the developments envisaged in the report for 1946.

During the war years the tackling of many problems had necessarily to be deferred, the advent of an approximation of peace-time conditions meant that it was possible to make a start at coping with them. Unfortunately the time had come when an unusually large number of the staff had become due for leave, (actually in many cases very much overdue) and this proved something of a handicap for most of the year, however, in spite of this it can be said that real progress had been made in several important items.

The spate of building activities, with the necessity for scrutiny of plans and inspections, hampered to some extent the endeavours made to prevent the alarming development of unauthorised huts and temporary buildings, but steady progress was made in developing the efficiency of the food inspection scheme and a continued improvement in the standard of milk supplied in the town was noted.

In addition, much consideration was given to the long overdue revision of by-laws. The mechanism for bringing about reforms in this respect is necessarily a slow-moving one, but work done in this respect ultimately bears fruit and helps to smooth out future difficulties.

Details of the progress in the various branches are embodied in the individual sections, but one significant trend is evident, that from a study of the year's statistics there appears to be a general deterioration in health. It would be unwise to attach undue significance to the figures for one year only, but it must be admitted that the situation gives rise to some anxiety.

The plain fact is that, having regard to the steadily increasing overcrowding of the town, the difficulties in tracking down and dealing promptly with infectious disease, and the lack of education and discipline amongst a large bulk of its inhabitants, it is surprising that the deterioration has not become evident before this time.

The two factors universally accepted as giving guidance to the sanitary state of a community are the Infant Mortality Rate and the Tuberculosis Incidence and Mortality Rates. During the past year both of these have significantly increased. In the case of the former this is particularly disappointing since the past seven years have shown such encouraging improvement, the rate falling from 149 for all races in 1941 to 97 in 1946 whereas in 1947 it was 148.

It appears that the vigorous work carried out by the Maternity and Child Welfare Services has stemmed the tide of infant mortality for a long time and progressed in spite of adverse influences, such as mal-nutrition and overcrowding, but the time has now come where they are beginning to fight a losing battle. With luck, and favourable climatic conditions, it is possible for a community to defy the laws of health for a time and get away with it, but this can only be for a time. There is a limit to the degree of squalor and overcrowding which can be tolerated and overcrowding is probably the most important single factor in undermining the health of a community.

It is depressing to note the appalling difficulties in dealing with this very problem. The solution is the provision of adequate housing and the enforcement of discipline, firstly to see that the houses are occupied by bona fide workers in Nairobi and secondly to prevent them from deliberately overcrowding their houses with relatives and hangers on. The application of discipline to the fluctuating and irresponsible African population of the town is a task to daunt the strongest, but it seems very probable that if such discipline is not attained by strong measures disease will obtain a greater and greater hold.

T.B. and the diseases of infancy are not the only dangers which menace the town. Lurking in the background are malaria and plague, and the latter disease becomes more and more dangerous as the overcrowding of decrepit and rat-ridden buildings increases.

In view of the considerable difficulties confronting all branches of the Public Health Department for the reasons stated above, cooperation from the public of all communities assumes a very considerable importance. Co-operation can be regarded as being negative or positive in character. The former means that members of the public take the trouble to report nuisances and irregularities to the Department effectively and often, the latter means that the public do not produce their own health problems by their own dirtiness, carelessness and ignorance. Negative co-operation is a great deal more prominent than the other variety at present and likely to be so for some time, but, although it is not without value, it would be infinitely preferable if individuals would willingly share in the task of keeping the town clean and healthy as well.

Apart from the routine handling of nuisances and irregularities by taking action under the By-laws a steady flow of propaganda has been started in an effort to sharpen the public conscience. This consists particularly of broadcasts in English and Hindustani and in cinema shows in the African Locations.

An additional anxiety in the background of the administration of the Public Health Services has been the steady rise in costs. In this respect the organisation merely shares in a problem which confronts every kind of enterprise at present, but it is nevertheless unfortunate that such a handicap should be present at a time when there is such a great demand for activity and development.

During the past year the difficulty has to some extent been mitigated by a close examination of the financial aspect and by the introduction of a number of economies. This has helped in maintaining as high a standard as possible. It is hoped that conditions may become stabilised in the near future, otherwise the situation will have to be faced that increased funds may be needed to maintain the services at the present level, or cuts in services may have to be made. The latter alternative is one which must be avoided if possible.

It must not be forgotten that a good deal of Public Health work is in the nature of an insurance policy. Although, somtimes, obvious and dramatic results are not evident the occurrence of a severe epidemic with its disorganization, disablement and loss of life brings this point forcibly home to the public. Nairobi has for a long time escaped such an object lesson. It is hoped that such immunity may continue, but it can only continue if constant vigilance is exercised.

# Geographical, Historical and General Circumstances

Nairobi, the capital of Kenya, is situated in the Highlands about 250 miles from the coast, and is 330 miles by rail from the Port of Mombasa, and 257 miles by rail from the Port of Kisumu on Lake Victoria.

Its geographical position is:—

| | | |
|---|---|---|
| Latitude .. .. | 1° 16' 43" | South |
| Longitude .. .. | 36° 50' | East |

Height a.s. l. From 5,452 feet to 5,700 feet
Area of Municipality—20,544 acres or
32.1 Square Miles.

The history of Nairobi, and of the Colony generally, is not a long one. The country was unknown in 1880, and began first to be developed in 1888 by the Imperial British East Africa Company. The administration of this Company was taken over by the Imperial Government in 1895, and the country was renamed Kenya in 1920.

In 1895 the railway was begun inland from the Port of Mombasa. A settlement sprang up at the railhead, and became the nucleus of a new town. This was the beginning of Nairobi, and ten years later, in 1905, it had progressed so far that the Capital was transferred there from Mombasa.

The establishment and progress of Nairobi has always been intimately connected with the railway, and owes its present site to its influence. In the light of later experience, this was not altogether fortunate, and preferable sites could have been chosen for a town which is likely to develop to the extent to which Nairobi can be anticipated to do.

Climatic conditions obtaining in Nairobi are unique. There are many large towns situated at comparable altitudes but none so near the equator. The combined effects of altitude, and direct solar radiation upon the health of the inhabitants, will prove an interesting field for investigation. It is known that the decrease in the mean annual temperature is 2.5 degree for over 1,000 feet above sea level. This, therefore, gives Nairobi a mean temperature of rather less than 68 degree F., which is in general, a very comfortable climate for Europeans and the effect upon new arrivals is often to produce the illusion that their environment is very similar to that at home. This is, however, not correct. The warm days are quickly followed after sunset by cool nights, and special precautions should be taken against these sudden changes of temperature, even though the extreme maximum summer temperature is not above 88.0 degree in the shade. It is to be noted that pneumonia is one of the frequent causes of death in the mortality figures for all races.

The Seasons are characterized by the long rains from March to May, and the short rains in October and November. Periods of very considerable rainfall can occur during the long rains, but there is considerable annual variation. The total rainfall varies between 35'' to 50'' per annum.

One other factor is of particular interest, in connection with the background of Nairobi, and that is the peculiar distribution of the population. In the town itself there are areas of very considerable congestion in the African Locations and Asiatic districts. The European poulation, however, and part of the Indian, is very considerably dispersed. Houses on plots of land varying from half to ten acres are scattered over the 32 square miles comprising the Municipality. This latter feature creates its own problems in the economy and administration of the Public Health Services, especially the Sanitary Service and the Mosquito Control. The fact that most of the residents in the district also work in Nairobi also creates considerable traffic problems in the city area, which are likely to become more and more difficult as time progresses.

## CLIMATIC DATA

| | Humidity 1947. | | | | | | Rainfall 1947 | | Average for the past thirty years. 1918-- 1947 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0.830 h | | | 14.30 h | | | | | | |
| 1947 | Dry B. oF | Wet B. oF | per cent | Dry B. oF | Wet B. oF | per cent | Total monthly fall (inches) | Days of rain | Total monthly fall (inches) | Days of rain |
| Jan. | 65.1 | 59.5 | 74 | 78.8 | 62.7 | 43 | 6.30 | 8 | 1.58 | 4 |
| Feb. | 66.5 | 59.9 | 70 | 81.6 | 61.9 | 35 | 9.87 | 5 | 2.03 | 4 |
| Mar. | 64.1 | 61.0 | 84 | 77.7 | 63.5 | 48 | 7.80 | 12 | 5.23 | 9 |
| Apr. | 64.6 | 61.3 | 84 | 76.1 | 64.2 | 55 | 11.41 | 18 | 7.79 | 14 |
| May | 62.8 | 59.7 | 85 | 72.5 | 63.0 | 61 | 5.01 | 17 | 5.10 | 13 |
| June | 59.7 | 57.2 | 87 | 71.1 | 61.0 | 58 | 2.66 | 5 | 1.61 | 6 |
| July | 58.8 | 55.6 | 83 | 71.2 | 61.1 | 59 | 0.82 | 4 | 0.59 | 4 |
| Aug. | 57.8 | 54.8 | 84 | 69.4 | 59.0 | 57 | 0.00 | — | 0.96 | 4 |
| Sep. | 60.1 | 56.2 | 80 | 75.7 | 59.8 | 42 | 1.05 | 4 | 0.95 | 4 |
| Oct. | 62.1 | 57.7 | 79 | 78.4 | 60.5 | 38 | 0.12 | 3 | 2.01 | 7 |
| Nov. | 61.8 | 59.2 | 87 | 75.2 | 61.4 | 48 | 2.31 | 12 | 3.96 | 14 |
| Dec. | 63.4 | 59.9 | 83 | 74.7 | 61.7 | 50 | 2.22 | 14 | 2.46 | 9 |
| Year | 62.2 | 58.5 | 82 | 75.2 | 61.7 | 49 | 40.57 | 104 | 34.27 | 92 |
| | Short Dry Season (Jan. to Feb.) | | | | | | 7.17 | 3.61 | | |
| | Long rains (March to May) | | | | | | 24.22 | 18.12 | | |
| | Long Dry Season (June to Sept.) | | | | | | 4.53 | 4.11 | | |
| | Short rains (Oct. to Dec.) | | | | | | 4.65 | 8.43 | | |
| | | | | | | | 40.57 | 34.27 | | |

## VITAL STATISTICS.

Two very striking and not unrelated changes have taken place during the year. The first is that the population of Nairobi has increased by over 17,000 during the year; an increase of 16%, compared with

4.3% increase in 1943
9.7% „ „ 1944
3.6% „ „ 1945

and a decrease of 1.8% in 1946.

This startling growth in population clearly brings problems of its own, and there is reason to believe that when the figures of the recent census are available they will show the above estimate to be on the low side. Many firms who require labour, and who have attracted labour to the town, have no housing for them, whether European or African, and therefore overcrowding is becoming a serious problem. Furthermore, the essential public services such as the sanitary services and the Police, which are much more closely integrated than is often realised, being based on a much smaller unit are unable to expend in the same degree.

The change in population is greatest amongst the Europeans who have increased by 23%. The Asian population has increased by little more than 2% only. The strain on the European housing can readily be imagined, and overcrowding in some of the hotels at times reaches alarming proportions.

In the African locations there is terrible overcrowding. It is estimated at present that, whilst nearly 40,000 Africans live in overcrowded conditions about another 5,000 Africans in Nairobi have no accommodation at all at night. They find for themselves some sort of shelter in insanitary and unauthorised structures dotted about such areas as the Swamp and parts of Eastleigh, and, as may be imagined when people, and particularly primitive people live in such unsatisfactory conditions, many turn to a life of crime.

Though most of the increase of population is due to immigration, the differential fertility in the European and Asian populations is worth noting. It is estimated on a comparative basis that the net reproduction rate of the Asians in Nairobi is about 2.71 whereas that of the Europeans is about .81; that is, whereas the Europeans are not maintaining themselves the Asians are almost trebling themselves in every generation. This fact can be correlated with a different standard of living between the two races evident to even the most casual observer, and also with the figures for the school population which show that, whilst there are about three Asians Adults for every European, the relative proportions in the child-age groups is seven to one.*

The small increase in the Asian Population during the year can almost entirely be accounted for by natural causes.

The second startling change is the rise in the infant mortality rate for all three races, an increase among Europeans of 42 per cent, among Asians of 63 per cent and among the Africans of 215 per cent.

The European figures are based on probably rather too small a population to have very much significance, but it is worth noting that there has been a steady increase in European infant mortality during the past seven years, and that this year's figures stand comparison with those of such towns as Hull, Swansea, Cardiff, and Birmingham of a few years ago, notwithstanding that the average social level of the populations of these towns is so widely different from that of the European population here.

The Asian infant mortality rate has been falling steadily in the last 8 years from the very high figure of 146 down to below 60. This year, however, the rate has jumped up to nearly 100. The African rate having stood in the 140's for three years has soared to 224.

Among the causes of infant deaths the principal increases are in:—

| | |
|---|---|
| Gastro Enteritis | 500% |
| T.B. Lungs | 200% |
| Pneumonia | 73% |
| Prematurity | 48% |

the first three causes being closely related to overcrowding and the fourth to poverty.

These figures are too striking and consistent to pass unnoticed. It is now thoroughly accepted on all sides that the infant mortality rate is one of the best measures of the social conditions of a town or rural area, and it is impossible to escape the conclusion that the social conditions in Nairobi have very markedly worsened during the year despite the prosperity of the town. The factors which are generally accepted as being embraced by the term "social conditions" are:—

---

*From figures kindly supplied by the Director of Education.

a. Domestic overcrowding.
b. Unemployment.
c. Low Wages.
d. Proportion of women who have to work.
and e. Size of families.

Woolf of the Edinburgh Institute of Social Medicine and his colleagues who completed a few years ago a classical investigation into the relative influence of these factors, found that the most important were:—

a. Domestic overcrowding.
c. Employment at low wages.
d. Proportion of women who had to work.

It may seem surprising in so progressive a city, to say that there is here quite a considerable amount of employment at low wages amongst the European population, low that is compared with the accepted standard of living and with the cost of basic necessities; and this has its obvious effect on the third factor, the proportion of women who have to work. Overcrowding amongst all three races has already been noted.

## Population Figures for Nairobi as at 31st January, 1948.

(Sources: Estimates by Commodity Distribution Board, and by the African Affairs Department).

### Summary of Vital Statistics.

| | Estimated Population. | Number of Deaths | Death rate per 1,000 | Live Births. | Birth rate per 1,000 of popn | Number of Infant Deaths | Infant Mortality rate per 1,000 Live Births. |
|---|---|---|---|---|---|---|---|
| Europeans | 13,500 | 95 | 7.04 | 236 | 17.48 | 15 | 63.56 |
| Asians | 38,000 | 343 | 9.03 | 1,668 | 43.89 | 164 | 98.33 |
| Africans and Others | 77,000 | 906 | 11.76 | 1,346 | 17.47 | 302 | 224.37 |
| Total | 128,500 | 1,344 | 10.46 | 3,250 | 25.44 | 481 | 148.00 |

### Population Figures for Nairobi as at 31st January, 1948.

| | Males | Females | Total |
|---|---|---|---|
| Europeans ... | 6,490 | 7,010 | 13,500 |
| Asians ... | 23,056 | 14,944 | 38,000 |
| Africans and Others | 59,460 | 17,540 | 77,000 |
| Total ... | 89,006 | 39,494 | 128,500 |

### Population—Comparative Figures for 5 years.

| Race | | 1943 | 1944 | 1945 | 1946 | 1947 |
|---|---|---|---|---|---|---|
| European | ... | 9,421 | 10,431 | 10,257 | 10,377 | 13,500 |
| Asian | ... | 30,829 | 31,877 | 36,517 | 37,191 | 38,000 |
| African and Others | ... | 59,022 | 66,592 | 66,040 | 63,183 | 77,000 |
| Total | ... | 99,272 | 108,900 | 112,814 | 110,751 | 128,500 |

## MARRIAGES.

### Christian Marriages Celebrated in Nairobi.

| Europeans | Indians | Goans | Seychelles | Natives |
|---|---|---|---|---|
| 217 | 2 | 30 | 3 | — |

## NUMBER OF BIRTHS NOTIFIED—1947.

| | Resident | | | Non-Resident | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| | S Births | L.Births | Total | S.Births | L.Births | Total | S.Births | L.Births | Total |
| **European** ... | 6 | 236 | 242 | — | 129 | 129 | 6 | 365 | 371 |
| **Asian** ... | 50 | 1,668 | 1,718 | 3 | 40 | 43 | 53 | 1,708 | 1,761 |
| **African and Others** | 52 | 1,346 | 1,398 | 73 | 791 | 864 | 125 | 2,137 | 2,262 |
| | 108 | 3,250 | 3,358 | 76 | 960 | 1,036 | 184 | 4,210 | 4,394 |

### Resident Live Births for Past Five Years.

| Race | | 1943 | 1944 | 1945 | 1946 | 1947 |
|---|---|---|---|---|---|---|
| European | ... | 196 | 249 | 211 | 168 | 236 |
| Asian | ... | 938 | 1,252 | 1,515 | 1,566 | 1,668 |
| African and Others | ... | 797 | 1,009 | 2,510 | 1,351 | 1,346 |
| | | 1,931 | 2,510 | 4,236 | 3,085 | 3,250 |

### Birth Rates (Live Births per 1000 of the Population).

| Race | | 1945 | 1946 | 1947 | Increase | Decrease |
|---|---|---|---|---|---|---|
| European | | 20.47 | 15.9 | 17.48 | 1.58 | |
| Asian | Indian | 40.86 | 41.31 | 43.89 | 2.58 | |
| | Goan | 38.98 | | | | |
| African and Others | | 18.88 | 20.47 | 17.47 | | 3.00 |

### MATERNAL MORTALITY RATES.

| Race | Live and Still Births | Maternal Deaths | Rate/1,000 Births |
|---|---|---|---|
| European ... | 242 | — | — |
| Asian ... | 1718 | 7 | 0.40 |
| African and Others ... | 1398 | 4 | 0.29 |

### INFANT MORTALITY RATES.

( corrected for outward transfer.)

| Race | Live Births | Infant Deaths | Rate per 1,000 Live Births |
|---|---|---|---|
| European ... | 236 | 15 | 63.56 |
| Asian ... | 1,668 | 164 | 98.33 |
| African and Others ... | 1,346 | 302 | 224.37 |
| | 3,250 | 481 | 148.00 |

### Comparative Infant Mortality Rates for Seven Years.

| Year | European | Asian | African and Others | All Races |
|---|---|---|---|---|
| 1941 | 20 | 146 | 180 | 149 |
| 1942 | 33 | 127 | 165 | 137 |
| 1943 | 36 | 95 | 207 | 135 |
| 1944 | 49 | 62 | 154 | 97 |
| 1945 | 33 | 56 | 131 | 86 |
| 1946 | 48 | 60 | 148 | 97 |
| 1947 | 64 | 98 | 224 | 148 |

## Infant Deaths.

(All Races)

| | | | | | | Total |
|---|---|---|---|---|---|---|
| January | 31 | May | 39 | September | 38 | 108 |
| February | 32 | June | 49 | October | 49 | 130 |
| March | 23 | July | 56 | November | 46 | 125 |
| April | 40 | August | 35 | December | 43 | 118 |
| | 126 | | 179 | | 176 | 481 |

## CAUSES OF INFANT DEATHS.

| Disease. | Europeans | Asians | Africans | Total |
|---|---|---|---|---|
| Asthma | 1 | 1 | — | 2 |
| Asphyxia Neonatorum | — | 2 | 2 | 4 |
| Anaemia | — | 2 | 1 | 3 |
| Anencephaly | — | 1 | — | 1 |
| Birth Injury | 1 | — | 1 | 2 |
| Burns | — | — | 1 | 1 |
| Bronchitis | — | — | 1 | 1 |
| Congenital Syphilis | — | 1 | 18 | 19 |
| Convulsions | 1 | 2 | 1 | 4 |
| Cerebral Hæmorrhage | 4 | 4 | — | 8 |
| Cellulitis | — | — | 1 | 1 |
| Congenital Heart Disease | 1 | 6 | 1 | 8 |
| Cardiac Failure | 2 | 10 | 1 | 13 |
| Diarrhœa | — | 6 | 1 | 7 |
| Dysentery | — | 7 | — | 7 |
| Diphtheria | — | — | 1 | 1 |
| Erythrœdema | — | — | 1 | 1 |
| Encephalitis | — | — | 1 | 1 |
| Gastro Enteritis | — | 4 | 44 | 48 |
| Icterus Neonatorum | — | 2 | — | 2 |
| Intussusception | — | — | 1 | 1 |
| Ill-defined | 1 | 15 | 13 | 29 |
| Malaria | — | — | 5 | 5 |
| Marasmus | — | 19 | — | 19 |
| Meningitis | — | 2 | 2 | 4 |
| Meningitis, Tuberculous | — | — | 1 | 1 |
| Meningitis, Pneumococcal | — | 1 | 1 | 2 |
| Meningocele | — | — | 1 | 1 |
| Multiple Bee Stings | — | — | 1 | 1 |
| Ophthalmia Neonatorum | — | — | 1 | 1 |
| Pneumonia (Lobar) | — | 15 | 67 | 82 |
| Pneumonia (Broncho) | — | — | 61 | 61 |
| Prematurity | 4 | 42 | 42 | 88 |
| Peritonitis | — | — | 1 | 1 |
| Rickets | — | 11 | — | 11 |
| Spina Bifida | — | — | 1 | 1 |
| Umbilical Sepsis | — | — | 1 | 1 |
| Umbilical Hæmorrhage | — | 1 | — | 1 |
| Pinks Disease | — | 1 | — | 1 |
| Tuberculosis (Lungs) | — | — | 19 | 19 |
| Toxæmia | — | 5 | — | 5 |
| Septicæmia | — | 1 | — | 1 |
| Streptococcal Dermatitis | — | — | 1 | 1 |
| Tetanus | — | — | 1 | 1 |
| Typhoid | — | — | 1 | 1 |
| Smallpox | — | — | 1 | 1 |
| Pyloric Stenosis | — | 1 | — | 1 |
| Whooping Cough | — | 1 | 1 | 2 |
| Fractured Skull | — | — | 1 | 1 |
| Retro-Pharyngeal Abcess | — | — | 1 | 1 |
| Mongolian Idiocy | — | — | 1 | 1 |
| Congenital Malformation | — | 1 | — | 1 |
| Total | 15 | 164 | 301 | 481 |

## Still Births.

| European | | Asian | | African | | Total | |
|---|---|---|---|---|---|---|---|
| Resident | Non-Resident | Resident | Non-Resident | Resident | Non-Resident | Resident | Non-Resident |
| — | 2 | **59** | — | **61** | 71 | **120** | 73 |

## Deaths of Infants under One Month.

| European | | Asian | | African | | Total | |
|---|---|---|---|---|---|---|---|
| Resident | Non-Resident | Resident | Non-Resident | Resident | Non-Resident | Resident | Non-Resident |
| **7** | 5 | **73** | — | **113** | 51 | **193** | 56 |

## DEATHS.

### Deaths by Race and Sex.

| | | European | Asian | African | Total |
|---|---|---|---|---|---|
| Resident | Male | **49** | **198** | **566** | **813** |
| | Female | **46** | **145** | **340** | **531** |
| | Total | **95** | **343** | **906** | **1,344** |
| Non-Resident | Male | 5 | 7 | 474 | 486 |
| | Female | 7 | 1 | 327 | 335 |
| | Grand Total | 107 | 351 | 1,107 | 2,165 |

## Summary of Causes of Death.

| | European | Asian | African and Others. | Total. | Percentage of all Deaths. | Death Rate. | Percentage of all Deaths, 1946. | Death Rate 1946. |
|---|---|---|---|---|---|---|---|---|
| 1. Infectious and Parasitic Diseases ... | 14 | 23 | 183 | 220 | 16.4 | 1.71 | 19.6 | 1.76 |
| 2. Cancer and Other Tumours | 13 | 6 | 8 | 27 | 2.0 | 0.21 | 2.7 | 0.25 |
| 3. Rheumatism and Diseases of Nutrition, etc: ... | — | 11 | 9 | 20 | 1.5 | 0.16 | 3.8 | 0.35 |
| 4. Diseases of the Blood, etc. | 2 | 8 | 7 | 17 | 1.3 | 0.13 | 0.6 | 0.05 |
| 5. Poisoning ... | — | 2 | 2 | 4 | 0.3 | 0.03 | 0.3 | 0.02 |
| 6. Diseases of the Nervous System ... | 12 | 23 | 48 | 83 | 6.2 | 0.65 | 8.2 | 0.74 |
| 7. Diseases of the Circulatory System ... | 24 | 43 | 66 | 133 | 9.9 | 1.04 | 4.8 | 0.42 |
| 8. Diseases of the Respiratory System ... | 1 | 41 | 302 | 344 | 25.6 | 2.68 | 23.4 | 2.11 |
| 9. Diseases of the Digestive System ... | 5 | 27 | 75 | 107 | 7.9 | 0.84 | 8.5 | 0.76 |
| 10. Non-Venereal Diseases of the Gastro-Urinary System | 6 | 10 | 11 | 27 | 2.0 | 0.21 | 2.6 | 0.23 |
| 11. Diseases of Pregnancy, Child-Birth & Puerperal State ... | — | 7 | 4 | 11 | 0.8 | 0.86 | 1.4 | 0.13 |
| 12. Diseases of the Skin ... | — | — | 3 | 3 | 0.2 | 0.02 | 0.3 | 0.02 |
| 13. Diseases of the Bones and Joints ... | — | — | — | — | — | — | 0.1 | 0.01 |
| 14. Congenital Malformations | — | 5 | 7 | 12 | 0.9 | 0.09 | 0.4 | 0.04 |
| 15. Diseases of Early Infancy | 9 | 113 | 122 | 244 | 18.2 | 1.90 | 11.1 | 1.01 |
| 16. Old Age ... | 1 | 1 | 3 | 5 | 0.4 | 0.04 | 0.9 | 0.08 |
| 17. Deaths from Violence ... | 8 | 19 | 42 | 69 | 5.1 | 0.54 | 7.4 | 0.67 |
| 18. Ill Defined ... | — | 2 | 4 | 6 | 0.4 | 0.05 | 4.1 | 0.37 |

## CAUSES OF DEATH.

(corrected for outward transfer only)

### Group 1.—Infectious and Parasitic Diseases.

| | European | Asian | African and Others | Total |
|---|---|---|---|---|
| 1. Typhoid ... | — | 1 | 6 | 7 |
| 3. Tick Typhus ... | 2 | — | — | 2 |
| 4. Relapsing Fever ... | — | — | 1 | 1 |
| 6. Smallpox ... | — | — | 4 | 4 |
| 7. Measles ... | — | — | 5 | 5 |
| 9. Whooping Cough ... | — | 1 | 5 | 6 |
| 10. Diphtheria ... | — | 2 | 3 | 5 |
| 11b. Influenza ... | — | 2 | 1 | 3 |
| 13. Dysentery (Bac:) ... | — | 1 | 6 | 7 |
| 16. Poliomyelitis ... | 4 | — | 1 | 5 |
| 18. Cerebro Spinal Meningitis ... | 1 | – | 4 | 5 |
| 20. Anthrax ... | — | — | 1 | 1 |
| 22. Tetanus ... | — | — | 4 | 4 |
| 23. Tuberculosis (Lungs) ... | 3 | 3 | 43 | 49 |
| 24. T.B. Meningitis ... | — | 1 | 2 | 3 |
| 25. T.B. Abdominal ... | — | 2 | 1 | 3 |
| 32. T.B. Generalised ... | 1 | — | 10 | 11 |
| 32a. T.B. Miliary ... | — | — | 18 | 18 |
| 33. Leprosy ... | — | 1 | — | 1 |
| 34. Syphilis ... | — | — | 4 | 4 |
| 34a. Syphilis (Congenital) ... | — | — | 29 | 29 |
| 35.2 Vaginitis ... | — | — | 1 | 1 |
| 36a. Pneumococcal Septicæmia ... | — | — | 6 | 6 |
| 36b. Pyæmia ... | — | — | 1 | 1 |
| 36c. Gas Gangrene ... | — | 1 | 1 | 2 |
| 38. Malaria ... | 2 | 4 | 21 | 27 |
| 42. Bilharzia ... | — | — | 1 | 1 |
| 44. Blackwater Fever ... | — | 2 | — | 2 |
| 36. Septicæmia ... | 1 | 2 | 2 | 5 |
| Totals ... | 14 | 23 | 183 | 220 |

### Group 2.—Cancer and Other Tumours.

| | European | Asian | African and Others | Total |
|---|---|---|---|---|
| 46. Carcinoma of Colon ... | 7 | 2 | 5 | 14 |
| 46R ,, ,, Liver ... | 1 | — | — | 1 |
| 47. ,, ,, Lung ... | 1 | — | — | 1 |
| 48. ,, ,, Uterus ... | 1 | — | — | 1 |
| 49. ,, ,, Ovary ... | 1 | — | — | 1 |
| 50. ,, ,, Breast ... | 2 | 1 | — | 3 |
| 51. ,, ,, Bladder ... | — | — | 1 | 1 |
| 53. Lymphosarcoma ... | — | 3 | 1 | 4 |
| 54b. Tumour of Brain ... | — | — | 1 | 1 |
| Totals ... | 13 | 6 | 8 | 27 |

### Group 3.—Rheumatism, Diseases of Nutrition, etc.

| | European | Asian | African and Others | Total |
|---|---|---|---|---|
| 59. Diabetic Coma ... | — | 5 | 1 | 6 |
| 56. Rheumatism ... | — | — | 1 | 1 |
| 63. Rickets ... | — | 4 | — | 4 |
| 69. Vomiting and Diarrhœa | — | — | 2 | 2 |
| 69.2 Toxæmia ... | — | 2 | 5 | 7 |
| Totals ... | — | 11 | 9 | 20 |

### Group 4.—Diseases of the Blood, etc.

| | European | Asian | African and Others | Total |
|---|---|---|---|---|
| 44. Erythroblastosis ... | — | — | 1 | 1 |
| 70. Hæmorrhage (of New Born) ... | — | — | 1 | 1 |
| 71. Anæmia ... | 1 | 7 | 4 | 12 |
| 72. Hodgkins Disease ... | 1 | 1 | 2 | 2 |
| 72a. Lymphatic Leukæmia ... | — | — | 1 | 1 |
| Totals ... | 2 | 8 | 7 | 17 |

### Group 5.—Poisoning.

| | European | Asian | African and Others | Total |
|---|---|---|---|---|
| 163. Poisoning ... | — | 1 | — | 1 |
| 164. Poisoning (Probably Copper Sulphate) ... | — | 1 | — | 1 |
| 178. Poisoning. Cyanide ... | — | — | 1 | 1 |
| 179. Poisoning. Alcoholic ... | — | — | 1 | 1 |
| Totals ... | — | 2 | 2 | 4 |

### Group 6.—Diseases of the Nervous System.

| | European | Asian | African and Others | Total |
|---|---|---|---|---|
| 78. Cerebral Abscess ... | — | 3 | 3 | 6 |
| 79. Meningitis ... | 1 | 4 | 20 | 25 |
| 81. Progressive Muscular Atrophy ... | 2 | — | — | 2 |
| 82. Cerebral Hæmorrhage ... | 4 | 7 | 7 | 18 |
| 81.3 Myelitis ... | 1 | — | — | 1 |
| 78b. Encephalitis ... | 1 | — | — | 1 |
| 84. Insanity ... | — | — | 12 | 12 |
| 82b. Cerebral Thrombosis ... | 2 | 3 | 1 | 6 |
| 84c. Insanity and Pellagra ... | — | 1 | 2 | 3 |
| 85. Epilepsy ... | 1 | 2 | 3 | 6 |
| 86. Convulsions ... | — | 2 | — | 2 |
| 87. Cerebral Degeneration ... | — | 1 | — | 1 |
| Totals ... | 12 | 23 | 48 | 83 |

**Group 7.—Diseases of the Circulatory System.**

| | European | Asian | African and Others | Total |
|---|---|---|---|---|
| 90. Pericarditis ... | — | — | 1 | 1 |
| 91. Endocarditis ... | 2 | 1 | 2 | 5 |
| 92. Aortic Incompetency ... | — | — | 1 | 1 |
| 93. Myocarditis ... | 5 | 3 | — | 8 |
| 94. Coronary Thrombosis ... | 4 | 6 | — | 10 |
| 95. Heart Disease ... | 2 | 1 | 1 | 4 |
| 95b. Dropsy ... | — | 1 | — | 1 |
| 97.3 Arteriosclerosis ... | 1 | — | — | 1 |
| 98. Gangrene ... | — | — | 1 | 1 |
| 99. Cardiac Embolism ... | 1 | — | — | 1 |
| 102. Hypertension ... | 1 | 4 | — | 5 |
| 103. Shock and Hæmorrhage ... | — | — | 1 | 1 |
| 200. Heart Failure ... | 8 | 27 | 59 | 94 |
| Totals ... | 24 | 43 | 66 | 133 |

**Group 8.—Diseases of the Respiratory System.**

| | European | Asian | African and Others | Total |
|---|---|---|---|---|
| 105. Oedema of the Larynx ... | — | 2 | 1 | 3 |
| 107. Pneumonia (Broncho) ... | — | 9 | 102 | 111 |
| 108. Pneumonia (Lobar) ... | — | — | 40 | 40 |
| 109. Pneumonia (undiff.) ... | — | 24 | 150 | 174 |
| 111. Congestion of Lungs ... | — | 2 | 2 | 4 |
| 106. Chronic Bronchitis ... | 1 | 1 | 3 | 5 |
| 110. Hæmothorax ... | — | 1 | 2 | 3 |
| 112. Asthma ... | — | 2 | — | 2 |
| 182. Suffocation ... | — | — | 2 | 2 |
| Totals ... | 1 | 41 | 302 | 344 |

**Group 9.—Diseases of the Digestive System.**

| | European | Asian | African and Others | Total |
|---|---|---|---|---|
| 115.2 Ludwigs Angina ... | — | — | 1 | 1 |
| 115.3 Quinsy ... | — | — | 1 | 1 |
| 117. Gastric Ulcer ... | — | 1 | — | 1 |
| 115. Retropharyngeal Abscess ... | — | — | 2 | 2 |
| 118.2 Hæmorrhage ... | 1 | — | — | 1 |
| 119. Gastro-Enteritis ... | — | 14 | 56 | 70 |
| 121. Gangrene of Appendix ... | 1 | — | 1 | 2 |
| 122. Strangulated Hernia ... | 1 | 2 | 2 | 5 |
| 124. Cirrhosis of Liver ... | — | 6 | 5 | 11 |
| 122b. Intestinal Obstruction ... | 1 | 2 | 1 | 4 |
| 126. Biliary Calculus ... | 1 | 1 | — | 2 |
| 129. General Peritonitis ... | — | 1 | 6 | 7 |
| Totals ... | 5 | 27 | 75 | 107 |

### Group 10.—Non-Venereal Diseases of Genito-Urinary System.

| | European | Asian | African and Others | Total |
|---|---|---|---|---|
| 130. Nephritis ... | 1 | 7 | 2 | 10 |
| 131. Chronic Nephritis ... | — | — | 1 | 1 |
| 132. Uraemia ... | 5 | 2 | 2 | 9 |
| 133. Toxic Nephritis ... | — | 1 | 4 | 5 |
| 136. Perineal Abscess ... | — | — | 1 | 1 |
| 139. Chronic Salpingitis ... | — | — | 1 | 1 |
| Totals ... | 6 | 10 | 11 | 27 |

### Group 11.—Diseases of Pregnancy, Child Birth, and Puerperal State.

| | European | Asian | African and Others | Total |
|---|---|---|---|---|
| 141. Ante-partum Hæmorrhage ... | — | 1 | 1 | 2 |
| 142. Ectopic Gestation ... | — | — | 1 | 1 |
| 144. Post-partum Hæmorrhage ... | — | 1 | 1 | 2 |
| 145a. Puerperal Septic Cerebral Embolism ... | — | 1 | — | 1 |
| 146. Eclampsia ... | — | 2 | — | 2 |
| 147. Toxæmia of Pregnancy ... | — | 1 | — | 1 |
| 149. Obstetric Shock ... | — | 1 | 1 | 2 |
| Totals ... | — | 7 | 4 | 11 |

### Group 12.—Diseases of the Skin.

| | European | Asian | African and Others | Total |
|---|---|---|---|---|
| 152. Cellulitis ... | — | — | 2 | 2 |
| 153. Dermatitis ... | — | — | 1 | 1 |
| Totals ... | — | — | 3 | 3 |

### Group 13.—Diseases of the Bones and Joints.

None.

### Group 14.—Congenital Malformations.

| | European | Asian | African and Others | Total |
|---|---|---|---|---|
| 157. Malformation of the Heart ... | — | 3 | 4 | 7 |
| 157b. Spina Bifida ... | — | — | 1 | 1 |
| 157c. Congenital Pyloric Stenosis ... | — | 2 | 2 | 4 |
| Totals ... | — | 5 | 7 | 12 |

**Group 15.—Diseases of Early Infancy.**

| | European | Asian | African and Others | Total |
|---|---|---|---|---|
| 158. Marasmus ... | 1 | 17 | 13 | 31 |
| 159. Prematurity ... | 5 | 88 | 88 | 181 |
| 141.2 Abortion ... | — | — | 1 | 1 |
| 149. Delayed Labour ... | — | — | 2 | 2 |
| 157.1 Semi-Headless Monster ... | — | — | 1 | 1 |
| 160. Birth Injuries ... | 1 | 2 | 11 | 14 |
| 161. Icterus Neonatorum ... | — | 1 | 4 | 5 |
| 161a. Atelectasis ... | 2 | 2 | 1 | 5 |
| 161a. Asphyxia ... | — | 1 | 1 | 2 |
| 161c1 Anæmia (Umbilical Hæmorrhage) | — | 2 | — | 2 |
| **Totals ...** | 9 | 113 | 122 | 244 |

**Group 16.—Old Age.**

| | European | Asian | African and Others | Total |
|---|---|---|---|---|
| 162. Senility ... | 1 | 1 | 3 | 5 |
| **Totals ...** | 1 | 1 | 3 | 5 |

**Group 17.—Deaths from Violence.**

| | European | Asian | African and Others | Total |
|---|---|---|---|---|
| 165. Hanging (Suicide) ... | — | — | 4 | 4 |
| 167. Gun shot wound ... | 1 | 2 | — | 3 |
| 171. Unspecified suicide ... | — | — | 1 | 1 |
| 164. Suffocation ... | 1 | — | — | 1 |
| 174. Stab wound (Homicide) ... | 1 | — | 2 | 3 |
| 178. Gas poisoning (Accidental) ... | 2 | — | 2 | 4 |
| 181. Burns ... | — | — | 6 | 6 |
| 183. Drowning ... | — | — | 3 | 3 |
| 184. Gun shot wound ... | 2 | — | 2 | 4 |
| 179. Alcoholic poisoning ... | — | — | 1 | 1 |
| 186. Motor accident ... | 1 | 14 | 8 | 23 |
| 194.2 Stab wound ... | — | — | 3 | 3 |
| 194. Fractured skull ... | — | 3 | 2 | 5 |
| 195. Fractured spine ... | — | — | 2 | 2 |
| 198. Legal Execution ... | — | — | 6 | 6 |
| **Totals ...** | 8 | 19 | 42 | 69 |

**Group 18.—Ill-defined Diseases.**

| | European | Asian | African and Others | Total |
|---|---|---|---|---|
| 200.3 Unknown and Natural Causes ... | — | 2 | 4 | 6 |
| **Totals ...** | — | 2 | 4 | 6 |

## INFECTIOUS DISEASES.

The number of Infectious Diseases notified during the year was 978, compared with 717 in 1946.

Malaria accounted for 353, Tuberculosis 202, the Dysenteries 175 and Typhoid Fever 61.

Apart from Malaria the remaining total of 625 is more than double that of last year, the chief increase being in Tuberculosis which has trebled itself and in the Dysenteries which have jumped from 3 to 175.

This latter rise may to some extent be due to improved efficiency of notification, but all the same a considerably increased incidence must be accepted. This year, for the first time, Amoebic Dysentery has been made notifiable, and 53 cases are reported.

Although Poliomyelitis occurs continually to some extent among the Africans, there was a sharp outbreak of this disease among the Europeans towards the end of the year. A case was first diagnosed and officially notified on the 16th November, but tracing of contacts, etc. then revealed five more cases which had occurred during the previous three weeks, and which, their private practitioners agreed, had probably been mild cases of this disease. Further cases arose on the 17th, 26th, 27th, and 28th November and 8th and 16th December, all being under the age of twelve. Loreto Convent, where four cases occurred, was closed, but the other schools continued, though all parents were advised against taking their children into any unaccustomed child-groupings and all public Christmas parties and other functions and most private ones were cancelled.

From the epidemiological characters of the outbreak it appeared probable at the time that it arose from some child bringing the disease to this country from abroad, probably in sub-clinical or sub-paralytic form. At the time of writing (April 1948) there has been only one further European case—in a child who had arrived from the United Kingdom only a few weeks before, and had had scarcely any contacts in Nairobi.

Tuberculosis is a disease which is rapidly assuming a first class importance in the city. The table below shows the result of a review of Infectious Diseases for the quinquennium 1943 to 1947 inclusive.

The principal infectious, that is preventable, causes of death are shown in the order of their killing power. Deaths are those of Nairobi residents only.

It will be seen that Tuberculosis is the chief killer for all races, followed by Malaria. Syphilis kills many Africans, chiefly little children who inherit it.

For any infectious disease to account for 2% of all deaths (and still more 10%) is a serious matter and that this disease should be Tuberculosis, in a country where protective foods are plentiful and sunshine the rule, must give rise to considerable searching of heart among thoughtful people.

Another table shows the relationship of the Tuberculosis and Malaria returns for 1947, to the corresponding returns for the five year period 1942 to 1946 inclusive.

It will be noted that there is among the Europeans a quite marked increase in the death rate from Tuberculosis and Malaria.

Preventive inoculations, of which over 27,000 were performed during the year, continued to cause inconvenience to intending travellers, largely, be it noted, through their own neglect to take the elementary precaution of keeping their Smallpox and Yellow Fever Certificates up to date.

However, in the last four months of the year, the Egyptian Cholera epidemic has caused unavoidable hardship, as one could hardly be expected to keep up to date with Cholera when the immunity only lasts six months, just on the chance of being compelled to fly through Egypt at short notice.

The periods of validity for Smallpox and Yellow Fever are 3 years and 4 years respectively, though Egypt, the Sudan and Northern Rhodesia are at present requiring Smallpox certificates not more than 2 years old. These periods are of course liable to alteration by any country at any time, depending on the epidemic situation in that country, from time to time.

It is only when the individual wants to leave Kenya that a certificate of immunity from Yellow Fever becomes essential, and in Kenya at the stated times, the inoculation can be obtained free.

## PRINCIPAL INFECTIONS CAUSES OF DEATH ARRANGED IN DESCENDING ORDER OF FREQUENCY BY RACES.

Five Year Period, 1943 to 1947. (Inclusive)

| Europeans | | | Asians | | | Africans | | |
|---|---|---|---|---|---|---|---|---|
| Cause | No. of Deaths | Per cent of all European Deaths | Cause | No. of Deaths | Per cent of all Asian Deaths | Cause | No. of Deaths | Per cent of all African Deaths |
| TUBERCULOSIS | 7 | 1.9 | TUBERCULOSIS | 31 | 2.5 | TUBERCULOSIS | 358 | 10.0 |
| Malaria | 6 | 1.6 | Malaria | 22 | 1.8 | Syphilis | 139 | 3.9 |
| Typhoid | 3 | 0.8 | Dysentery | 15 | 1.2 | Malaria | 106 | 2.9 |
| Dysentery | 1 | 0.3 | Typhoid | 6 | 0.5 | Dysentery | 99 | 2.8 |
| | | | Syphilis | 3 | 0.2 | Typhoid | 82 | 2.9 |
| | | | Leprosy | 1 | | Plague | 3 | |
| | | | Smallpox | 1 | | | | |

European Deaths from all causes:—369

Asian Deaths from all causes:—1,242

African Deaths from all causes:—3,585

Relationship of Tuberculosis and Malaria Returns for 1947, to corresponding returns 1942 to 1946 inclusive.

| | Increase per cent | Decrease per cent |
|---|---|---|
| **Tuberculosis Notifications::** | | |
| European | — | — |
| Asian | — | 14.7 |
| African | 46.7 | — |
| Average | 40.2 | |
| **Tuberculosis Death Rate:** | | |
| European | 130.8 | — |
| Asian | — | 11.2 |
| African | — | 11.1 |
| Average | | 8.46 |
| **Malaria Notification Rate:** | | |
| European | — | 77.3 |
| Asian | — | 28.0 |
| African | — | 68.3 |
| Average | | 52.83 |
| **Malaria Death Rate:** | | |
| European | 36.4 | — |
| Asian | — | 18.2 |
| African | — | 15.6 |
| Average | | 8.7 |

## NOTIFIABLE INFECTIOUS DISEASES BY RACES.

(excluding Malaria, for which see page 49)

| | European | Asian | African | Total |
|---|---|---|---|---|
| Anthrax ... | — | — | 1 | 1 |
| Blackwater Fever ... | — | 2 | — | 2 |
| Cerebro-Spinal Meningitis ... | 1 | 4 | 7 | 12 |
| Chicken Pox ... | 2 | — | 40 | 42 |
| Diphtheria ... | 2 | 10 | 12 | 24 |
| Dysentery (Amœbic) ... | 4 | 36 | 13 | 53 |
| Dysentery (Bacillary) ... | 7 | 78 | 37 | 122 |
| Encephalitis Lethargica ... | — | 2 | — | 2 |
| G. C. Conjunctivitis ... | — | — | 2 | 2 |
| Infective Hepatitis ... | — | — | 2 | 2 |
| Leprosy ... | — | 2 | 2 | 4 |
| Malta Fever ... | — | — | 4 | 4 |
| Measles ... | 1 | — | 4 | 5 |
| Mumps ... | — | — | 5 | 5 |
| Poliomyelitis ... | 13 | 4 | 12 | 29 |
| Plague ... | — | — | 1 | 1 |
| Puerperal Fever ... | — | 3 | 5 | 8 |
| Relapsing Fever ... | — | — | 6 | 6 |
| Scarlet Fever ... | 2 | — | — | 2 |
| Smallpox ... | — | — | 11 | 11 |
| Tick Typhus ... | 13 | — | 11 | 24 |
| Trypanosomiasis ... | 1 | — | — | 1 |
| Tuberculosis ... | — | 11 | 191 | 202 |
| Typhoid Fever ... | — | 23 | 38 | 61 |
| Totals ... | 46 | 175 | 404 | 625 |

## MONTHLY TABLE OF NOTIFIABLE INFECTIOUS DISEASES.

(excluding Malaria, for which see page 49)

| | January | February | March | April | May | June | July | August | September | October | November | December | Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Anthrax ... | — | — | — | — | — | — | — | 1 | — | — | — | — | 1 |
| Blackwater Fever ... | 1 | — | — | — | — | — | — | — | — | 1 | — | — | 2 |
| Cerebro Spinal Meningitis | — | 1 | — | 1 | 1 | 1 | 4 | 2 | 1 | 1 | — | — | 12 |
| Chicken Pox ... | — | — | — | — | — | — | — | 2 | 8 | 12 | 12 | 8 | 42 |
| Diphtheria ... | — | — | 1 | — | 1 | 5 | 1 | 2 | 1 | 3 | 4 | 6 | 24 |
| Dysentery (Amœbic) ... | 1 | 1 | — | 2 | 1 | 12 | 8 | 12 | 7 | 3 | 5 | 1 | 53 |
| Dysentery (Bacillary) ... | 16 | 13 | 7 | 11 | 11 | 18 | 8 | 4 | 11 | 6 | 16 | 1 | 122 |
| Encephalitis Lethargica ... | — | — | — | — | — | 1 | — | 1 | — | — | — | — | 2 |
| G. C. Conjunctivitis ... | — | — | — | — | — | — | — | 1 | — | — | 1 | — | 2 |
| Infective Hepatitis ... | — | — | — | — | — | — | — | 2 | — | — | — | — | 2 |
| Leprosy ... | 2 | — | — | — | — | — | 1 | — | — | — | 1 | — | 4 |
| Malta Fever ... | — | — | — | — | — | 1 | — | — | — | 1 | 1 | 4 | 4 |
| Measles ... | — | — | — | — | — | — | — | — | — | — | 3 | 2 | 5 |
| Mumps ... | — | — | — | — | — | — | — | 1 | 1 | — | 3 | — | 5 |
| Poliomyelitis ... | — | — | — | — | — | 2 | 1 | 3 | — | 2 | 17 | 4 | 29 |
| Plague ... | — | — | — | — | — | — | — | — | — | — | — | 1 | 1 |
| Puerperal Sepsis ... | — | — | — | — | — | 1 | — | 2 | 1 | 1 | 3 | — | 8 |
| Relapsing Fever ... | — | 1 | — | — | — | 1 | 1 | — | — | — | 3 | — | 6 |
| Scarlet Fever ... | 1 | — | — | 1 | — | — | — | — | — | — | — | — | 2 |
| Smallpox ... | — | — | — | — | — | — | 1 | — | 9 | — | 1 | — | 11 |
| Tick Typhus ... | 1 | — | — | — | — | 1 | 3 | — | 3 | 3 | 5 | 8 | 24 |
| Trypanosomiasis ... | — | — | — | — | — | — | — | 1 | — | — | — | — | 1 |
| Tuberculosis ... | 3 | 3 | 4 | 6 | 2 | 12 | 14 | 14 | 10 | 32 | 60 | 42 | 202 |
| Typhoid Fever ... | 6 | 1 | 5 | 5 | 6 | 8 | 5 | 10 | 1 | 4 | 7 | 3 | 61 |

## ADMISSIONS TO HOSPITAL.

### (And Patient-Days.)

| Hospital. | Europeans |  | Asians |  | Africans and Others |  | Total |  |
|---|---|---|---|---|---|---|---|---|
|  | Admissions | Patient Days. | Admissions | Patient Days. | Admissions | Patient Days. | Admissions | Patient Days. |
| European | 5 | 63 | — | — | — | — | 5 | 63 |
| Native C. Hospital | — | — | 6 | 85 | 148 | 2,034 | 154 | 2,119 |
| Infectious Diseases Hospital | 18 | 240 | 20 | 221 | 1,148 | 14,443 | 1,186 | 14,904 |
| Totals | 23 | 303 | 26 | 306 | 1,396 | 16,477 | 1,445 | 17,086 |

## COMMUNICABLE DISEASES AS AFFECTING RACES, TREATED IN HOSPITAL.

|  | European | Asian | African and Others | Total |
|---|---|---|---|---|
| Acute Poliomyelitis ... | 12 | 4 | 5 | 21 |
| Anthrax ... | — | — | 9 | 9 |
| C. S. Meningitis ... | 1 | 1 | 29 | 31 |
| Chicken Pox ... | 1 | 2 | 282 | 285 |
| Diphtheria ... | — | — | 22 | 22 |
| Encephalitis Lethargica ... | — | 1 | — | 1 |
| Leprosy ... | — | — | 2 | 2 |
| Malta Fever ... | 1 | — | 2 | 3 |
| Measles ... | — | — | 311 | 311 |
| Mumps ... | — | 2 | 99 | 101 |
| Puerperal Fever ... | — | 2 | 4 | 6 |
| Relapsing Fever ... | 2 | — | 6 | 8 |
| Scarlet Fever ... | 1 | — | — | 1 |
| Small Pox ... | — | — | 11 | 11 |
| Tick Typhus ... | 1 | — | 15 | 16 |
| Trypanosomiasis ... | 1 | — | — | 1 |
| Tuberculosis ... | 1 | 11 | 441 | 453 |
| Typhoid Fever ... | 2 | 1 | 54 | 57 |
| Whooping Cough ... | — | 2 | 104 | 106 |
| Totals ... | 23 | 26 | 1,396 | 1,445 |

## PREVENTIVE INOCULATIONS.

|  | Europeans | Asians | Africans | Total |
|---|---|---|---|---|
| Yellow Fever ... | 2,659 | 4,434 | 1,273 | 8,366 |
| T.A.B. ... | 285 | 124 | 9,553 | 9,962 |
| Diphtheria ... | 22 | — | — | 22 |
| Small Pox ... | 1,069 | 3,619 | 3,726 | 8,414 |
| Cholera ... | 283 | — | — | 283 |
| Plague ... | 2 | — | 13 | 15 |
| Totals ... | 4,320 | 8,177 | 14,565 | 27,062 |

## SANITARY ADMINISTRATION

The year under review proved to be an unusual one so far as the administration of the Sanitary Section was concerned. For the first time since 1939 the weight of war conditions became lighter, yet paradoxically, the burden on the staff, or on that part of the staff remaining on duty, became much heavier. Several members of the inspectorate took much-overdue vacation, two or three having served for nine and ten years without overseas leave.

Although attempts were made to spread the absences over the year as equally as possible, the shipping situation was the governing factor and it was inevitable that during two periods of the year staff depletions reached a dangerously low level. This might not have caused so much anxiety had the times been normal but the ebb of staff numbers met an extraordinary flow in building plans and supervisory work in connection with unprecedented building activity. Approved sanitary fittings were in most cases unobtainable and makeshift substitutes demanded more than the usual inspections if shoddy work with its concomitant dangers was to be avoided.

The increase in building can best be illustrated by reference to the number of completion certificates issued, 646 being despatched during the year as against 333 for the previous twelve months. The average numbers for the immediate preceeding decennial period was 237.

So much time was taken up with such work to the detriment of routine inspections of dwellings, shops and other premises that steps became necessary to relieve sanitary inspectors of work connected with the scrutiny of plans and the supervision of the sanitary works in new buildings. Owing to unfortunate and unforeseen circumstances however, this change had to be postponed.

Previous reports have stressed the importance, and the intention, of removing those conditions which are inimical to the production and distribution of a sound and uncontaminated food supply and the methods which have been planned cannot be implemented until the inspectors can use to better service the time now spent on the scrutiny of plans, the interviews and the actual inspection of works in progress.

Although we are well aware of the attitude of Government and of the Municipal Council on questions of housing no report would be complete without some reference to the deplorable conditions which have occupied a considerable part of the inspectors' time, particularly during the last few months of the year.

For the causes we need not seek. For remedies we can make but one recommendation, more housing. There may be other ways of dealing with a situation that may easily get out of hand but they are hardly the concern of a Public Health Department. In dealing with the hovels and shacks dotted about the town and the shanty-town which is set almost in the centre of the commercial area we have met with problems which only new legal powers can help to settle. The fact must be faced that thousands of Africans in Nairobi are without homes. To turn the shanty-dwellers out of one hut is but to disturb them for a day or two. A new group of huts can be thrown up almost overnight. To discover the actual owner in order that legal action may be taken is not the easy thing that the uninitiated think it to be.

Sometimes days are taken up in enquiries, whereas it takes but a few hours to erect a hovel. And that explains quite a lot. When illegalities can be and are perpetrated at a greater speed than legal process can cope with them, some other method of arresting the growth must be devised.

A memorandum on the question of hovel-towns has been sent to the appropriate authorities and the following extract at once illustrates the difficulties and makes suggestions for their removal:—

"On visiting various areas, it becomes apparent that any Legislation framed to deal with the question will have to be of a direct character i.e. giving power for direct action. Any proposed method of dealing with these scores of shacks must waive all ideas of serving notices on the named owners. Such methods get us nowhere. I suggest that a magistrate be authorised to inspect any hut on representations being made by us. That the magistrate will see a notice fastened to the structure addressed to the "owner" not by name (unless this is known beyond doubt), the notice will intimate that the building will be demolished after say, three days, and if the owner wishes to raise any objection against such action he must do so by appearing before the magistrate at a time and place to be specified.

"This suggestion is not so severe in fact as it may appear on first consideration. The only buildings a magistrate would be asked to condemn are those which, even to one knowing little or nothing about building, would be recognised as an unauthorised structure. The inspector would, of course, give sworn evidence that the building was put up without authority and give all such information as the magistrate might require.

"A further amendment to the law should be the revocation of that part which precludes action against offenders who had built their huts or houses over one year previously. This is a loophole which needs early closing. It is too easy for people to say they had built it thirteen months before—not so easy for an inspector to say it was not in being at such and such a date. An unauthorised building should not become legally established merely by the passage of time.

"The plain fact is that a way past legal impediments must be found. The only real effective action is for demolition squads protected by the police, physically to demolish structures of the Swamp and other plague spots, while inhabitants are removed beyond the Municipal boundary.

"While this Department is fully prepared to devote the maximum efforts possible to removing this serious state of affairs it seems obvious that this must be accompanied by vigorous action on the part of the Police periodically to round up and remove the hordes of criminal vagrants who cause the demand for unlawful housing."

While the unhoused population numbers thousands this problem of unauthorised buildings, of shacks constructed for the most part of rubbish will always be a source of worry. Not only has the building of houses for Africans not kept pace with the steady increase in the town's population but the arrears are mounting to a degree which is most disturbing. Laudable efforts have been made in the erection of very pleasing cottages, small dwellings which have received the approbation of several visiting members of parliament and others. But, those people whose eyes and ears are nearest to the multitude know full well that, splendid though such efforts are, they leave an ever widening gap between needs and achievement.

Some years ago—at the time when the first group of these modern cottages was being completed—the suggestion was made that blocks of tenements were the clamant need of the times as providing more accommodation for the same monetary outlay. The reply was to the effect that the days of barrack-like dwellings were over. They must not be allowed to return. Yet people—no matter how few—who might have been housed in such barracks, are now existing and suffering in hovels which beggar description.

Africans as a race, are, in common with other people, possessed of varying ideas of civilization and of what constitutes a desirable dwelling house. The transfer of a man from the reserve into a new semi-detached cottage for example, may not be appreciated by him, indeed he might feel more at home, and happier, in a less pretentious lodging. And so the need for varying types of houses to suit the tastes of all. As the vast majority are satisfied with very little in the way of hygienic accommodation it seems a pity that they, or a proportion of them, are brought to the stage when even a few sheets of salvaged petrol tins nailed to packing-case-wood, suffice as a dwelling place. And all because idealism outweighs a necessarily austere utility.

One of the strongest objections of the Health Department to African housing of a temporary nature has, in the past, been the difficulty, indeed one might say the impossibility of keeping vermin under control.

With modern insecticides of lasting potency some of the opposition to buildings other than those of brick, stone or concrete has been considerably reduced.

There are local materials which may be used for most of the construction of African houses and, provided supervision of erection is of high order and design and layout properly planned there can be little genuine opposition at the present time to a lowering of our structural standards provided supervision can be maintained throughout their comparatively short life.

Any temporary villages must of necessity, have their own supervisory staff, and owners and occupiers of houses must agree to overseers doing a stern and what may appear to be at times an overbearing job, otherwise the re-establishment of Nairobi's erstwhile black spot, the late Pangani village, would be repeated with all its horrors.

The shortage of materials of a permanent nature together with the lack of artisans makes consideration of such quarters an urgent necessity but, in the interests of the inhabitants of Nairobi the extra-mural spaces of Nairobi should be set aside for the purpose.

If the needs of Nairobi's labour requirements can only be met by having a floating population numbering many thousands then the place for their temporary housing should be outside the boundaries of the town and arrangements made for their conveyance to and from the premises of possible employers. Once employed in a permanent or semi-permanent capacity, however, the housing should become the concern of the employer. Too little thought appears to have been given to this problem in the past and quite large concerns have, in effect, been subsidised in-so-much as their labour, or part of it has been accommodated on the Councils sub-economic housing estates.

Asians and Europeans, also, are compelled through lack of accommodation, to exist in overcrowded and demoralising conditions, and advantage is taken of their misfortune by an unscrupulous type of property owner, boarding house keeper or hotel proprietor to exploit them.

The best possible efforts by the Council's staff cannot remove all those conditions which tend to make life miserable and which, indirectly, play their part in undermining the health of the unfortunate.

Temporary military buildings continued as a disfigurement to the town and too many of them remained a potential menace to the health of the occupants and others. These buildings together with the older permanent or semi-permanent properties which have fallen into an irreparable state, may be sites of dangers upon which it is unnecessary to enlarge.

The large number of overcrowded and badly kept houses also shows no diminution. With occupants protected (and rightly so) by the Rents Ordinance, owners who would rebuild their almost delapidates buildings cannot do so, as such a course involves rehousing the tenants, and alternative accommodation is not available. With the decline in fitness of houses generally through the war years and the present need for extensive repairs or rebuilding, the demands for renewals and renovations increase as time goes on. Some properties are not worth the expenditure of much money and the owners—not without reason—object to pouring money into a bottomless pot.

One of the greatest evils is the terrible overcrowding which exists particularly among the artisan section, where many workmen have no more floor space in their dingy lodgings than what they lie upon.

Truly, the demand is for houses—a demand which cannot be met by present methods within the foreseeable future. We are fortunate with our climate to be able to enjoy reasonable comfort in buildings of much lighter construction than is deemed necessary in colder climates and there are pre-fabricated dwellings which with very little adaptation could be considered as permanent buildings. Lighter and cheaper construction is possible and if the situation is to be remedied—building with such ideas in mind will provide the only reasonable solution.

As regards Europeans—to help meet the situation the council built and equipped during the latter half of the year the Kirk Road Hostel—an establishment of temporary construction—which provides good lodging for approximately one hundred people. In addition, "Ann's House" and the Delamere Avenue Hostel, which, together, furnish accommodation for sixty-four women, have been conducted under the aegis of the Municipal Council for some considerable time.

In past years the African has received attention regarding his housing needs to the almost complete exclusion of the unofficial European and Asian, it being considered that these people were in a position to provide their own accommodation. Times have changed and Government and the Railway Administration despite their very laudable building programmes of past years, realise the urgent necessity of building at a rate hitherto unknown. More houses for officials are now planned and at the end of the year works of construction about to begin include the scheme for 70 dwellings of pisi-de-terre. Such construction, using local earths will, if properly supervised and carried out, take the place of buildings of more traditional materials and the saving in stone and cement will be an item of some importance.

As for maintenance costs these are perhaps problematical but any experiment is worth while which might prove to reduce the crippling costs of building in more permanent materials. There seems to be no solution, however, to the problem of bringing down the costs of essential fittings and their installation while maintaining a reasonably high standard of hygienic protection.

Towards the end of the year under review the councils European Housing Scheme off the Ngong Road was fully planned and an early start on these permanent buildings was to be expected in the new year.

This scheme comprises 14 three bedroom dwellings 10 with two bedrooms and 40 double bedroomed flats. And so it is not without a feeling of some satisfaction that it is possible to record this evidence of active steps taken to satisfy a very real need.

Of equal importance to housing questions is that of ensuring a wholesome food supply,

Earlier in this report mention has been made of the intended reorganisation to permit of greater supervision and control of premises used for the sale, packing, preparation and manufacture of food. The staff is fully conscious of the importance of this branch and is aware of the many shortcomings connected with the various food trades. Action has been taken and programmes prepared to place the food supplies of the town in a position where the utmost reliability can be placed upon them. This action includes the medical examination of employees, provision for their proper clothing, inoculations and advice against contagious and infectious diseases, and the registration and periodical examination of all people whose work brings them into direct contact with foodstuffs.

Elsewhere in this report will be found a section dealing with milk supplies. One of the greatest problems with which the department has ever had to deal has been that of securing a clean unadulterated and wholesome milk supply from sources which in large measure are conducted on the most primitive lines.

For many years the retailers of highly adulterated and dirty milk have been prosecuted and heavily fined or sent to prison but, presumably the illegal profits of the trade are considered to be worth the risk.

The figures given under the heading "Sanitation" relate to the work done by the Food Inspector but if the actions of all inspectors including the Municipal Inspectors are taken into account, and the minor offences are included, then the number of prosecutions and the fines, with costs, are as follows:—

| | | | | |
|---|---|---|---|---|
| 1947 | Prosecutions | 126 | Fines and Costs | Shs. 4,673/- |
| | and the previous five years read:— | | | |
| 1946 | Prosecutions | 152 | Fines and Costs | Shs. 3,080/- |
| 1945 | Prosecutions | 71 | Fines and Costs | Shs. 698/- |
| | (With one exception these were comparatively minor cases) | | | |
| 1944 | Prosecutions | 93 | Fines and Costs | Shs. 2,704/- |
| | (During this year 17 prison sentences were awarded, the result of this course being reflected in the figures for 1945, although, it is not claimed that it was solely responsible for the reduction.) | | | |
| 1943 | Prosecutions | 40 | Fines and Costs | Shs. 744/- |
| 1942 | Prosecutions | 29 | Fines and Costs | Shs. 848/- |

And so the work goes on, but, notwithstanding, we have the continued adulteration of a most important article of diet. While the profit motive remains with the trade some people will always endeavour to fake this easiest of all foods to adulterate.

Ice cream, mineral waters and many other foods and drinks, also need constant supervision and it is to be hoped that the coming months and years will see an intensification of efforts to secure a really safe food supply.

## THE INSPECTION AND SUPERVISION OF FOOD.

The necessity for the maintenance of an efficient system of supervision and control of the public food supply cannot be over estimated. Without food life cannot long be sustained. In the maintenance of good health it is essential that the food supply of a community should not only be sufficient in quantity but suitable also in quality and nutritional value. The adequacy and nature of the food consumed is a matter for the dietitian and is a subject of great significance, but the protection and control of the food supply for which the Public Health Department is primarily responsible is of equal importance. The importance of this control is even greater in such a community as that administered by this Council for there exist in our midst all the potentialities of food-borne diseases which if uncontrolled could lead to epidemics of formidable proportions.

Probably in no comparable community is there such a diversity of disease organisms in such close contact with food supplies. For here are carriers of diseases not only endemic in East Africa, but imported from almost every corner of the world. Unfortunately those most free from these diseases have the least part in handling food, while those most likely to be infected are in general those most intimately connected with its preparation.

By force of circumstances, therefore, it behoves every member of the community to do everything possible to obtain for Nairobi a system of food control which surpasses any yet seen elsewhere for until that is accomplished no-one can be assured of being safeguarded. The scope of such a programme is so vast and the old unhygienic habits are so deeply rooted that considerable time and patience will be required before there is in the average non-European mind a realization of what hygiene is and why it is necessary, and it will be even longer before this knowledge is translated into normal practice and behaviour. Education and propaganda form part of the long term policy and efforts are already being made in this direction. Articles have been written for the African Press and full use made of the opportunity provided by the ''Country Comes to Town'' exhibition. A film was produced, photographed by this Department, showing the dangers associated with adulterated milk. The local character of this film and the Swahili commentary made a great appeal to the African and was shown during the 3 days to over 1,000 people. Apart from this however, and in spite of the difficulties, a determined effort is even now being made to improve conditions under which food is sold details of which are given below.

**Milk.** Practically the whole of the milk consumed in the Municipality comes from the outlying districts and is produced in places where there is little official supervision. Consequently the quality of the milk is almost entirely dependent upon the ability and conscience of the producer and the amount of personal supervision he is able to apply to the milking process. Owing to the distance the milk has to be brought, much of it is 24 hours old before it reaches the dairy. During this time it deteriorates bacteriologically and is liable to be adulterated.

A small proportion of the milk is pasteurized at the source, but up to the present there has been no check on the efficiency of the pasteurization. Most of the milk sold in the registered dairies is produced on recognized dairy farms, but there were in addition during the years under review, 138 licensed native purveyors. These sell milk (produced by their own cows which graze outside the municipal boundary) from churns and cans of all varieties carried either on bicycles or handcarts, or from unregistered premises on the Native locations. Six persons were prosecuted during the year for using their rooms for the storage and sale of milk, but the total number of these unauthorised dairies is probably not less than 50. It is the intention of this department to use vigorous means to suppress this most undesirable form of illicit trading and to promote the sale of good milk on such terms as will encourage the native to buy this in preference to the unwholesome and adulterated commodity which he so often buys at present. One of the most recent innovations in this respect is the delivery of bottled milk to regular customers from the Municipal Dairies.

With milk entering the town from such diverse sources there can be only one satisfactory method of control and that is by routing it through a central milk depot where all supplies can be examined, where unsatisfactory milk can be rejected, and the remainder pasteurized. This is still the ultimate aim, but meanwhile other methods of control have to be used.

It has long been recognised that a standard of bacterial purity would be of the greatest value in preventing unwholesome milk from reaching the consumer, but difficulties have arisen owing to the fact that bacteriological tests generally are complicated and slow and it is unpracticable to retain milk while awaiting results. What is required is a simple quick inexpensive test with a small experimental error. Such is now available in the Resazurin test which has been introduced by this Department. The advantages of this test are (1) it can be completed in 20 minutes and suspected milk can therefore be held pending the result. (2) owing to its speed it has a small experimental error. (3) it is not seriously affected by the degree of aggregation of the bacteria in the milk. (4) it is more sensitive than other tests to the growth of bacteria and to high cell counts such as are met with in mastitis.

The use of this test makes the introduction of a legal standard a practical proposition. Such a standard has in fact now been accepted in principle and is to be put into operation as soon as the necessary legislation can be framed. This standard will apply to all milk and will put Nairobi ahead of almost all other towns in Africa or Europe in the control of the bacterial purity of milk supplies.

During the year 156 Resazurin tests were carried out with the following results:—

| | | Number. | | | per cent. | |
|---|---|---|---|---|---|---|
| Category. | A. | B. | C. | A. | B. | C. |
| August ... | 7 | 1 | 7 | 46.6 | 6.8 | 46.6 |
| September ... | 9 | 6 | 5 | 45.0 | 30.0 | 25.0 |
| October ... | 40 | 4 | 4 | 83.3 | 8.3 | 8.3 |
| November ... | 31 | 5 | 0 | 86.0 | 14.0 | -- |
| December ... | 26 | 1 | 10 | 70.0 | 3.0 | 27.0 |
| Total ... | 113 | 17 | 26 | 72.4 | 11.0 | 16.6 |

**Ice Cream.** In many respects the general principles regarding milk apply equally to ice cream, for the freezing process, far from destroying harmful bacteria, may in fact assist in their preservation. Unfortunately owing to staff shortage the priority given to milk control has of necessity reflected samewhat adversely on the amount of supervision and testing of ice cream. Nevertheless there has been evidence of a growing "germ consciousness" on the part of producers; and in general those catering for Europeans have been willing and anxious for co-operation with this department. Advice has been given as to the best methods to adopt and samples have been submitted and examined, with results which indicate a steady improvement. As with milk, compulsory heat treatment followed by immediate cooling and freezing is the ultimate aim, and as soon as suitable plant is made available in sufficient quantity it is hoped that it will be possible to introduce legislation to this effect.

**Other Foods.** The supervision and control of all premises where food is sold or prepared has been continued as will be seen from the table of inspections set out in the following table. Of the 19 samples of mineral waters and other foods submitted for analysis 16 were satisfactory, two suspicious and one unsatisfactory.

**Prosecutions.** Legal proceedings were instituted and convictions obtained for offences in connexion with food regulations as shown hereunder:—

| | No. of convictions. |
|---|---|
| for Selling adulterated milk ... | 12 |
| Selling milk from dirty vehicles ... | 2 |
| Using unregistered premises as dairies ... | 6 |
| Employing dirty delivery boys ... | 1 |
| Exposing unsound food for sale ... | 1 |
| Obstruction ... | 1 |

**Swimming Bath.** During 1946 the swimming bath at the Salisbury Hotel was re-opened to the public and has ever since been under this Department's constant supervision. Some difficulties were experienced at the beginning which necessitated the bath being closed for short periods but these have now been overcome and the water judged visually, chemically and bacteriologically is being maintained in a thoroughly satisfactory condition.

## Summary of Sanitary work performed.

**Nuisances:**

Inspections made to:—

| | |
|---|---|
| Dwelling houses | 3,033 |
| Laundries | 61 |
| Offensive trades | 35 |
| Stables and cattle sheds | 9 |
| Trade premises and offices | 2,308 |
| Public buildings | 107 |
| Open spaces, streets, etc. | 1,712 |
| Miscellaneous premises | 85 |
| Complaints investigated | 279 |
| House to house inspections | 211 |
| Camps | 95 |
| Interviews | 1,322 |

**Defects Remedied:**

| | |
|---|---|
| Premises dirty and verminous | 325 |
| Dwellings unfit for habitation (including native huts) | 80 |
| Yards unpaved | 17 |
| Rat infested premises | 5 |
| Latrine accommodation defective or inadequate | 125 |
| Drains choked or defective | 104 |
| Septic tanks or pits defective | 48 |
| Waste water defective or inadequate | 77 |
| Accumulations of refuse | 203 |
| Food unprotected against rats | 25 |
| Sleeping in kitchens and foodstores | 7 |
| Mosquito breeding | 27 |
| Overgrown plots | 109 |
| Miscellaneous | 210 |

**Defects Remedied Following:**

| | |
|---|---|
| Verbal intimation | 821 |
| Written intimation | 89 |
| Statutory notices | 452 |

**Licences:**

| | |
|---|---|
| Trade premises inspected and reinspected | 2,456 |
| Taxi cabs inspections | 104 |
| Food carts: milk, meat, bread, sweetmeats | 311 |
| Milk purveyors examined | 390 |

**Installations Supervised:**

| | |
|---|---|
| Septic tanks | 168 |
| Conservancy | 13 |
| Water closets | 459 |
| Pail closets | 308 |
| Miscellaneous | 20 |

**Erection and Alteration of Buildings.**

| | |
|---|---|
| Plans scrutinised | 1,556 |
| Inspections made | 2,107 |
| Completion certificates issued | 646 |

**Infectious Diseases:**

| | |
|---|---|
| Inspections made | 56 |
| Cases investigated | 44 |
| Rooms with contents disinfected | 34 |

**Notices Served:**

| | |
|---|---|
| Intimation (all types) | 230 |
| Public Health Ordinance (Nuisance) | 314 |
| Public Health Ordinance (Others) | 13 |
| Rats and Mice (Destruction) Rules | 13 |
| Bylaws (Drainage) | 23 |
| ,, Mosquito Control (By Sanitary Inspectors only) | 113 |
| ,, 465 (G) | 4 |
| ,, 509 | 12 |
| ,, 510 | 7 |
| ,, 513 | 8 |
| ,, 518 | 8 |
| Miscellaneous | 18 |

**Prosecutions:**

| | Cases. | Convictions. | Withdrawn. | Acquitted. | Fines/Costs |
|---|---|---|---|---|---|
| Public Health Ordinance | 15 | 10 | 2 | 3 | Shs. 1,336 |
| Milk and Dairies Regulations | 24 | 18 | 4 | 3 | Shs. 3,942 |
| Rats and Mice Destruction Rules | 17 | 15 | 1 | 1 | Shs. 1,297 |
| Mosquito (Suppression) Bylaws | 19 | 16 | 3 | — | Shs. 745 |
| Miscellaneous | 13 | 11 | 1 | — | Shs. 646 |
| | 88 | 70 | 11 | 7 | Shs. 7,966 |

**Inspections of Premises Subject to Special Control.**

| Premises. | No. of Inspections. |
|---|---|
| Aerated water factories | 72 |
| Bakeries | 134 |
| Butchers | 510 |
| Dairies and Milk Shops | 540 |
| Eating Houses | 735 |
| Fishmongers | 112 |
| Food Factories | 209 |
| Groceries and Provisions | 492 |
| Hotels and Bars | 122 |
| Markets | 104 |
| Restaurants and tea-rooms | 197 |
| Vegetable sellers | 271 |
| Miscellaneous | 101 |
| | 3,599 |

**Unsound Food, Condemned.**

| | lbs. |
|---|---|
| Groceries and Provisions | 6,926 |
| Fruit and Vegetables ... | 18 |
| Ghee | 36 |
| Meat | 58 |
| Fowls | 18 |
| | 7,056 |
| Mineral waters | 268 bottles |
| Cod liver oil | 70 bottles |
| Milk | 293 gallons |

## INSPECTION OF MEAT.

Meat inspection was carried out at the Abattoir by one European Inspector assisted by an African Sanitary Inspector.

Butchers shops and stalls at the Market were visited weekly and consignments of pigs offals from Uplands Bacon Factory were inspected at the premises of Butchers dealing in this commodity.

Although there has been a reduction in the number of oxen slaughtered there has been a progressive increase in the weight of the meat inspected on account of more grade oxen being slaughtered.

The number of carcases passed for human consumption, known to be infected with Cysticercus Bovis is high and in fairness to the large number of visitors and new residents there should be no relaxation in the propaganda to inform the public of the risk of tapeworm infection from the consumption of underdone meat.

The underside of the roofs at the Abattoir have been limewashed to reflect light, otherwise there has been no improvement effected to provide much required additional accommodation and lighting to facilitate inspection.

The work of the year is summarised in the following tables:—

### CARCASES INSPECTED

| Animal | 1945 Number | Weight of meat passed lbs, | 1946 Number | Weight of meat passed lbs. | 1947 Number | Weight of meat passed lbs. |
|---|---|---|---|---|---|---|
| Grade Oxen ... | 3,266 | 2,569,976 | 4,409 | 3,059,916 | 8,963 | 5,217,918 |
| Native Oxen ... | 19,149 | 3,340,312 | 16,707 | 3,122,165 | 7,347 | 1,469,724 |
| Calves ... | 802 | 54,762 | 807 | 54,233 | 391 | 24,494 |
| Grade Sheep ... | 11,469 | 343,093 | 12,924 | 411,857 | 10,756 | 486,308 |
| Native Sheep ... | 10,045 | 212,800 | 9,248 | 199,625 | 16,006 | 370,150 |
| Goats ... | 13,671 | 380,000 | 12,924 | 319,625 | 20,723 | 517,975 |
| Pigs ... | 7,425 | 855,132 | 11,613 | 1,085,457 | 9,025 | 823,173 |
| Poultry ... | 86,698 | 216,745 | 79,265 | 198,162 | 60,323 | 150,707 |
| Total ... | 152,525 | 7,972,820 | 147,897 | 8,451,040 | 133,534 | 9,060,449 |

### CARCASES CONDEMNED.

| | 1945. Number | Rate per cent | 1946. Number | Rate per cent | 1947. Number | Rate per cent |
|---|---|---|---|---|---|---|
| Grade Oxen ... | 164 | 5.0 | 238 | 5.8 | 321 | 3.5 |
| Native Oxen ... | 3,105 | 16.2 | 2,896 | 17.2 | 1,122 | 15.2 |
| Calves ... | 143 | 17.8 | 115 | 14.2 | 119 | 30.4 |
| Grade Sheep ... | 64 | 0.5 | 99 | 0.7 | 265 | 2.4 |
| Native Sheep ... | 609 | 6.0 | 428 | 4.6 | 528 | 3.2 |
| Goats ... | 1,581 | 11.5 | 1,037 | 9.0 | 2,669 | 12.8 |
| Pigs ... | 76 | 1.0 | 83 | 0.7 | 66 | 0.7 |
| Poultry ... | 797 | 0.9 | 911 | 1.1 | 709 | 1.1 |
| Total ... | 6,539 | | 5,977 | | 5,799 | |

## "MEASLE" RATE.

| | Number of Carcases Condemned for Measles | Rate per cent | Number of Measley Carcases Passed | Rate per cent |
|---|---|---|---|---|
| Grade Oxen ... | 215* | 2.4 | 735 | 8.1 |
| Native Oxen ... | 875* | 11.9 | 574 | 7.8 |
| Calves ... | 106 | 26.6 | 1 | 0.2 |
| Total ... | 1,1196 | | 1,310 | |

*138,128 lbs. of Sterilized Measley Beef sold for human consumption.

## CONDITIONS NECESSITATING, CONDEMNATION.

| | G. oxen | N. oxen | Calves | G sheep | N. sheep | Goats | Pigs | Poultry |
|---|---|---|---|---|---|---|---|---|
| Bruising ... | 17 | 7 | — | 2 | 1 | 1 | 10 | 61 |
| Cancer ... | — | 4 | — | 3 | 1 | 4 | — | — |
| C. Bovis ... | 215 | 875 | 106 | — | — | — | — | — |
| C. Cellulosæ ... | — | — | — | — | — | — | 19 | — |
| C. Lymphadenitis ... | — | — | — | — | — | — | — | — |
| Dropsy ... | 1 | 6 | — | — | 11 | 6 | 1 | — |
| Dropsy and emaciation | 16 | 65 | — | 101 | 281 | 1,140 | 2 | — |
| East Coast Fever ... | — | — | — | — | — | — | — | — |
| Fevered ... | 53 | 142 | — | 110 | 167 | 978 | 10 | 134 |
| Foot and Mouth ... | — | — | — | — | — | — | — | — |
| Heartwater ... | — | — | — | — | 21 | 379 | — | — |
| Immaturity ... | — | — | 8 | — | — | — | — | — |
| Jaundice ... | 4 | 5 | — | 3 | 19 | 7 | 4 | — |
| Moribund ... | 1 | — | 1 | — | — | 6 | — | 113 |
| Pleuro pneumonia ... | — | — | — | — | — | — | — | — |
| Pyaemia ... | — | — | — | — | — | — | — | — |
| Rinderpest ... | — | — | — | — | — | — | — | — |
| Septic conditions ... | 4 | 7 | 1 | 35 | 20 | 103 | 15 | 403 |
| Tuberculosis ... | — | 8 | — | — | — | — | 1 | — |
| Pleurisy and Peritonitis | 3 | 1 | — | — | — | — | — | — |
| Anaplasmosis ... | — | 1 | — | — | — | — | — | — |
| Navel Ill ... | — | — | 2 | — | — | — | — | — |
| Lymphadenitis ... | — | — | — | 2 | 1 | 15 | — | — |
| Sarcocystis Miescheriana | — | — | — | — | — | — | 1 | — |

### Organs Condemned.

| | No. |
|---|---|
| Hearts ... ... ... ... ... | 1,876 |
| Heads ... ... ... ... ... | 508 |
| Tongues ... ... ... ... ... | 517 |
| Kidneys ... ... ... ... ... | 4,519 |
| Livers ... ... ... ... ... | 26,123 |
| Lungs ... ... ... ... ... | 24,443 |
| Spleens ... ... ... ... ... | 4,048 |
| Stomachs, etc. ... ... ... ... | 113 |
| Total ... ... ... ... ... | 62,147 |

### Total Weight of Meat Condemned (lbs.)

| | lbs. |
|---|---|
| Grade Oxen | 197,413 |
| Native Oxen | 331,830 |
| Calves | 9,732 |
| Grade Sheep | 23,140 |
| Native Sheep | 17,800 |
| Goats | 64,739 |
| Pigs | 24,078 |
| Poultry | 1,772 |
| Total | 670,504 |

### Disposal of Oxen.

| | Number | Rate per cent |
|---|---|---|
| Oxen Passed | 14,867 | 91.20 |
| ,, Cooked | 1,047 | 6.40 |
| ,, Processed | 389 | 2.35 |
| ,, Cremated | 7 | 0.05 |
| Total | 16,310 | 100.00 |

## NATIVE BURIALS.

| **Langata Cemetery.** | Burials. |
|---|---|
| C.M.S. Adults | 32 |
| do. Children | 72 |
| Gospel Furthering Fellowship | 8 |
| Pagan Cemetery | 1185 |
| Total | 1297 |

### African Cemetery—Kariakor.

| | |
|---|---|
| Roman Catholic | 41 |
| Salvation Army | 11 |
| Kikuyu Independent Church | 25 |
| Total | 77 |

## MUNICIPAL AMBULANCE.

| European Calls | Asian Calls | Miscellaneous Calls | Total Miles. | Total Calls. |
|---|---|---|---|---|
| 195 | — | — | 1617 | |
| — | 29 | — | 217 | |
| — | — | 45 | 147 | |
| 195 | 29 | 45 | 1981 | 269 |

## MUNICIPAL POUND

(Articles found on the streets)

| | | | |
|---|---|---|---|
| Oxen and Cattle | 208 | Lorries | 1 |
| Dogs | 171 | Fuel, (loads) | 6 |
| Potatoes (bags) | 11 | Fowls | 41 |
| Handcarts | 12 | Wooden Portable Boxes | 7 |
| Timber, (loads) | 2 | Mules | 2 |
| Sugar Cane, (Bundle) | 1 | Door Frames | 3 |
| Ponies | 2 | Wheel and Tyre | 1 |
| Donkeys | 29 | Tyres | 2 |
| Bicycles | 8 | Tables | 2 |
| Chair | 1 | Bread (bags) | 3 |
| Vegetables (bags) | 6 | Empty Bags | 56 |
| Goats and Sheep | 79 | | |

## CLEANSING DEPARTMENT.

The year ending 31st December, 1947 continued to be one of expansion, except in the Conservancy service, where totals were 8,251 buckets in 1946 and 6,841 buckets in 1947. All this drop was in Military Camps.

Refuse services were most severely taxed as the lorries are old, and new suitable types are slow in coming out from England. The total tonnage moved was 34,431 or a daily average of 97.65 tons.

The Street Cleansing Section had to hand over the lorry used by them to the Refuse Removal Section and this resulted in a slight decline in the standard of work as litter, etc. could only be removed when convenient for the Refuse service.

The Exhausters cleared:—

1,332 Conserving Tanks

579 Septic Tanks

8,286 Waste Water pits. In addition 258½ hours had to be spent on cleaning the sewers. This meant that gullies had to be cleansed by hand which is a most objectionable practice.

This Department requires new transport and the sooner this is obtained the sooner can the work of the Department be effectively performed. The work is all done under the Public eye and any shortcomings are the cause of complaint, regardless of the difficulties under which we have to operate. It is hoped that new vehicles will arrive soon and this will ease the transport situation.

## WATER

### Sources of Supply.

The supply of water available for treatment and consumption in Nairobi proved adequate for the first nine months of the year. With the approach of warmer weather, consumption increased considerably and low pressures were experienced in certain areas during the hours of daylight.

Constructional work on Ruiru Dam, which has now been redesigned to give a maximum depth of water of 60 feet, has been speeded up during the year.

To allow for the possibility of the available supply of water falling short of requirements before the proposed Chania scheme is in operation, Council approved a scheme for the construction of a filtration plant, pipe line and pumps for the abstraction of 500,000 gallons of water per day from Nairobi Dam and tenders were invited in December.

To allow for an ultimate additional supply of 7½ million gallons per day, investigations have been proceeding on the suitability of a dam on the Sasumua River. Gauging weirs have been constructed and trial boreholes have been sunk on the proposed site. The indications are that the chosen site is likely to prove suitable. In addition the preliminary survey along the route of the proposed pipe line was nearing completion by the end of the year and a site chosen for the proposed treatment works has been surveyed.

An order for the extension of the existing filtration plant from 3 to 4 million gallons per day has been placed and drawings have been received. Constructional work is likely to be completed during 1948.

Consequent upon the siting of a new Industrial Area, additional water mains were required and to date approximately 3½ miles of piping have been laid. Additions and repairs to the existing distribution system have been carried out involving the laying of about 6½ miles of piping.

The increase in the amount of building works carried out during the year is reflected in the increase in the number of private services connected. The total number of such services is now 5,619, of which 496 were connected in the twelve months.

A total of 55 water samples were tested for bacteriological purity during the year.

Analysed results are as follows:—

| | Number | per cent |
|---|---|---|
| Highly satisfactory ... ... ... | 28 | 51 |
| Satisfactory ... ... ... | 17 | 31 |
| Suspicious ... ... ... | 4 | 7 |
| Unsatisfactory ... ... ... | 6 | 11 |
| Total | 55 | |

The unsatisfactory reports were obtained mainly from samples taken in one area of the town at the beginning of the year, and the cause was determined and remedied.

Four chemical samples of town water were taken on which satisfactory reports were issued.

An historic date in the progress of Nairobi was reached in October, when, as a result of much testing and many minor, and some major improvements it was decided that the Nairobi water supply need no longer be boiled, a state of affairs which had existed since the day when the Railway Engineers first pitched their tents here in 1899. Henceforth the water may safely be drunk straight from the mains.

The attached table gives the daily quantity of water supplied by the various sources during the year, the total monthly and yearly deliveries and the average daily consumption per head.

## DELIVERY OF WATER 1947.

Average delivery per head per day is based on a population of 128,500, Quantities expressed in thousands of gallons.

| Source. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total for year | Total previous year | **Increase** or decrease per cent. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Kikuyu Springs | 1172 | 1157 | 1107 | 1140 | 961 | 1086 | 1040 | 1056 | 1087 | 1156 | 1069 | 1187 | 403,149 | 398,698 | **1.1** |
| Ruiru River | 1328 | 1396 | 1496 | 1364 | 1610 | 1564 | 1608 | 1618 | 1601 | 1563 | 1595 | 1501 | 556,442 | 409,706 | 35.8 |
| Boreholes | 6 | 6 | 6 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 2,745 | 12,993 | 78.9 |
| Total Daily Delivery | 2506 | 2559 | 2609 | 2512 | 2579 | 2658 | 2656 | 2682 | 2696 | 2727 | 2672 | 2696 | 962,336 | | |
| Daily Loss on Filter Washing | 2 | 1 | 1 | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | | | |
| Nett Daily Delivery | 2504 | 2558 | 2608 | 2510 | 2575 | 2656 | 2654 | 2680 | 2694 | 2725 | 2671 | 2694 | 961,634 | 800,747 | 20.1 |
| Nett Monthly Delivery | 77624 | 71624 | 80848 | 75300 | 79825 | 79680 | 82274 | 83080 | 80820 | 84475 | 80130 | 83514 | | | |
| Average Daily Delivery/Head | 19.5 | 19.9 | 20.3 | 19.5 | 20.0 | 20.7 | 20.6 | 20.9 | 21.0 | 21.2 | 20.8 | 21.0 | 20.45 | 19.6 | 4.3 |

## INFECTIOUS DISEASES (CONTROL) DEPARTMENT.

It was hoped that there would be a full complement of Inspectorate Staff for the I.D. (C) Department during the year, however—2 ex-army Inspectors resigned early in the year in order to take up posts they considered to be more lucrative and congenial. Mr. D. C. Klynsmith resigned at the end of the year after 4 years with the Malaria and Aedes Control Section. Mr. F. S. Cowburn, who had retired from Council's service in 1945, re-joined the Aedes Control in a temporary capacity and provided much needed and appreciated assistance at a time when the Department was very short staffed. Mr. J. Morrill, was seconded full time to Rodent Control work, and further depleted the Mosquito Inspectorate staff. This is now the second year the Department has been without the assistance of a full time permanent Rodent Officer.

**Leave.** Mr. Abdul Karmali, Mosquito Inspector, proceeded on leave to India in January, and returned to duty in June.

Mr. G. R. Cunningham-van Someren, Municipal Entomological Officer, proceeded on leave in July for six months, after 10 years service with the Council without home leave. The Department has been 3 men short throughout the year.

As a result of substantial cuts in the annual estimates it was found necessary to withdraw anti-malarial control from one third of the township area. The west side was the area selected.

Secondly, towards the end of the year, the Department, acting in accordance with instructions from Council, instituted experimental forms of mosquito control, finally carrying out control by means of units of searchers, oilers and labourers working under the supervision of an inspector. These units worked to a pre-arranged priority plan, in most areas of the town where malaria and mosquito breeding was considered worst. While the units carried out work in the unit areas control was abandoned in the remainder of the town. The results were not satisfactory.

**Expenditure.** For the Department for the year was £15,969 of which £9,560 was spent on General mosquito control, Malaria and Aedes Yellow Fever Control. This figure on the estimated population as shown by ration books, gives a per capita cost of Shs. 1.50 app. a very low figure. It is thought that the population figure of 128,500 is actually on the low side which would give an even lower per capita cost.

## Malaria.

As indicated in the opening paragraphs of the report, with the re-organisation necessitated by the cut in expenditure and the adoption of the modified control methods, it has been impossible to maintain the usual records for the year with the exception of notified malaria cases and adult catches in the routine stations. Larval control was withdrawn from the eastern section of the town and no searches were possible.

It was hoped that anti-adult measures would be commenced during the year, but this was financially impossible. Normal control methods were continued from January to November 15th, when the new system was commenced. Adult catches were made in all stations on Mondays. Oiling of sections commenced on Mondays and continued to Fridays so that the entire area of the township under control was oiled once per week. Saturday was reserved for records and equipment maintenance. Larval collectors commenced searching sections on Tuesday and followed one day after the oiling gang, thus acting as checks on the oiling efficiency. Any foci missed were oiled by the searcher or the oiling gang returned to rectify the position in the afternoon. All work was supervised by the European Inspectors. Afternoons were devoted to identification of material and recording and checking of work and investigating complaints and the hundred and one other minor duties with which the Inspectors have to cope, such as notice serving, staff matters with the African searchers and oilers.

The majority of the malaria control African staff are well trained ex-army Malaria Unit members. They have given very good service and it is regretted that a number of them had to be discharged towards the end of the year, owing to the cut in African establishment.

**Control.** The tendency, as a result of the re-planning of the town is to move the African locations and Commercial area of the town eastward or nearer to the uncontrolled areas and with this imminent spread, it will become more and more essential to extend control measures to the east of the town. Control must be centrifugal and centrepetal the centre requires attention but a clean belt must be prepared along the periphery, to prevent influx of vectors from the uncontrolled heavily infested areas to the east. The figures given in this report will show the necessity for this proposal—the vectors are to be found in numbers to the east and south-east of the town and with the erection of new African locations in that area the chances of malaria are being increased—the African and to a great extent the Asian form a constant reservoir of infection. It is imperative also that the malaria problem be considered while the new area is under construction—proper drainage in permanent material should progress side by side with railway re-alignment, roads and buildings—it will be cheaper in the long run to make the area "mosquito proof" with the growth of work rather than to leave this and call in the malaria control organisation when malaria becomes rife. This has never been the policy before and it is suggested that the new idea, the sound idea, be enforced now so that the malaria problem will never arise.

Generally there has been considerable building activity in the town, and new areas are being rapidly opened up, new roads built, but drainage lags behind—a serious problem will arise, unless adequate permanent drainage is laid now. The town has suffered from inadequate drainage for many years and has much lost ground to make up, therefore it is suggested that steps be taken now to carry out new drainage for these new housing estates and so avoid trouble in the future.

The completion of the five foot contour anti-malaria survey is a more urgent necessity than ever and the strongest recommendation possible is now put forward to have this survey completed, and finally this department would request closer co-operation with other departments when new building and planning schemes are under consideration.

**Malaria.** The year has been one of particular interest for the following reasons. The records demonstrate the very low number of notified cases contracted in Nairobi with an increase in death rate and case mortality with a considerable drop in the incidence. The smallest number of vector species larvae found, the highest recorded catches of adult vectors and finally the unusual phenomenon of the malaria peak in September.

**Notified Malaria Cases.** Malaria was made notifiable by By-law in 1930. Notification by practitioners of their cases could be speedier and their returns more complete. It is known that a few practitioners are slack in forwarding returns, but to facilitate the work of the practitioner and of this staff it is recommended that numbering of houses and premises should be pushed on with all speed so that identification of the location of cases can be better ascertained.

The following table gives at a glance the figures for cases contracted in Nairobi:—

### Malaria Cases by Months.

(Residents Contracted in Nairobi.)

| | Jan. | Feb. | Mar. | Apr. | May | Jun. | July | Aug. | Sept. | Oct. | Nov. | Dec. | Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Europeans ... | 1 | — | 2 | — | 1 | — | 4 | 2 | 2 | 2 | 1 | — | 15 |
| Asians ... | 24 | 17 | 14 | 26 | 21 | 29 | 21 | 21 | 28 | 11 | 4 | 5 | 221 |
| Africans ... | 6 | 2 | 6 | 8 | 9 | 13 | 16 | 20 | 27 | 4 | 5 | 1 | 117 |
| Totals ... | 31 | 19 | 22 | 34 | 31 | 42 | 41 | 43 | 57 | 17 | 10 | 6 | 353 |

The total notified 353 is the second lowest recorded since 1930. Relative figures for the preceding 10 years are given below:—

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1938 | 632 | 1939 | 545 | 1940 | 6342 | 1941 | 1684 |
| | | | | (Epidemic year) | | | |
| 1942 | 1363 | 1943 | 1487 | 1944 | 706 | 1945 | 310 |
| 1946 | 463 | 1947 | 353 | | | | |

**Analysis of Cases. Residents.**

Of the 15 European cases, 2 were relapses, so that primary cases are 13, the same number as for 1946. Cases were recorded for nearly each month of the year, the highest being four during July. There was one double infection sub- and Benign Tertian, and one Clinical, the remainder being sub-tertian. 5 Cases were juveniles and 8 cases were adults.

Of the 221 Asian cases, the peak period was July, 29 cases, though a high figure was maintained over the period April to September. Adults accounted for 117 cases. Sub-adults 37, and juveniles under 5 for 53.

201 cases were sub-tertian. 3 Benign, and 8 quartan, 2 Ovale, 1 double Sub-Benign and 6 Clinical.

Resident African cases numbered 117, the peak 27 being recorded in September. 106 cases were sub-tertian, 4 Benign and 4 Quartan with one clinical. Adults contracting were 51, sub-adults 13, and 48 children under 5.

Children accounted for 101 cases out of the total of 351. Sub-tertian cases were just over 90% of the total of all infections. As will be seen from the table, the peak period is September, this is most unusual as July is the normal peak month.

**Cases and District of the Town.**

The European cases were scattered throughout the town. The centre of the town and River Road, accounted for 134 of the Asian cases, the remainder being generally distributed throughout the Asian residential areas. Of interest are 11 cases from Parklands, and 8 cases, Salisbury Road area, it appears improbable that all infections were contracted in these districts, since they are not malarious, and only one *A. gambiae* was found in course of the year in the section adult Station (See Map).

It is more probable that infection was contracted by these Asians in the Commercial-River Road area as these people keep their shops open up to a late hour in the evening.

As is to be expected, the majority, 83 of the African cases occurred in the Native location areas, Kaloleni, Kariokor and Pumwani, the other cases being in Eastleigh, or in or near Asian areas.

## Death Rate and Incidence.

Total deaths were 27, all races, Europeans 2, Asians 4 and Africans 21 The population figure is given as 128,500 which would give a death rate of 0.21 per thousand an increase on the 1946 figure of 0.12 per thousand.

The case mortality was 7.65%, a high figure indeed when compared with 3.02% for 1946. The incidence is 2.75 per thousand.

The above figures go to prove that it is essential that control be strengthened rather than reduced and that there can be no let up in the control. A series of good years tends to lull one into a state of complacency and false security which is not to be tolerated.

### Malaria Cases by Months.

(Residents. Contracted outside Nairobi.)

| | Jan. | Feb. | Mar. | Apr. | May | Jun. | July | Aug. | Sept. | Oct. | Nov. | Dec. | Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **European** ... | 5 | 1 | — | 2 | 5 | 1 | 2 | 1 | 4 | 5 | 4 | — | 30 |
| **Asian** ... | 13 | 8 | 1 | 5 | 4 | 11 | 2 | 4 | 3 | 3 | — | 2 | 56 |
| **African** ... | 1 | 1 | — | — | 3 | 9 | 5 | 18 | 40 | 6 | 30 | 23 | 136 |
| **Total** ... | 19 | 10 | 1 | 7 | 12 | 21 | 9 | 23 | 47 | 14 | 34 | 25 | 222 |

As was the case with resident Nairobi contracted cases, the peak period is in September. It is strange that there should have only been 9 cases in July the recognised peak month. Again 90% of the cases were Sub-tertian. An analysis of age rates is of interest, 22 of the 30 Europeans, were adults and again with Asians, 50 were adults over 20 years of age, but of the African cases 35 were under one year and 88 between 1 and 5 years. It is very possible that the 112 cases were strictly not primary, since the majority were Lake area tribes who move to and fro from Nairobi regularly, it further appears doubtful if they indeed contracted malaria in Nairobi. It is not a little difficult to obtain satisfactory information from African patients, particularly women and children.

Turning to the figures following for non-residents contracting their malaria outside Nairobi, it will be seen that the majority of cases are again of children, 41 under 1 year, and 124 under 5 years of age. It is not a little alarming to have regular importations of cases into the town, particularly when gametocytes are present. Most of the notified cases are Railway employees who travel regularly to visit their lands in the Kisumu district and on each trip, return with their wife and latest child for a short stay in Nairobi.

Only 54 cases are of African adults and they again are of the Kavirondo tribes.

### Malaria Cases by Months.

(Non-Residents. Contracted outside Nairobi.)

| | Jan. | Feb. | Mar. | Apr. | May | Jun. | July | Aug. | Sept. | Oct. | Nov. | Dec. | Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| European ... | 5 | 2 | 4 | 1 | 6 | 1 | 5 | — | 2 | 1 | 1 | 2 | 30 |
| Asian ... | 2 | 5 | 3 | 6 | 4 | 2 | 4 | 10 | 4 | 2 | — | — | 42 |
| African ... | 8 | — | 6 | 5 | 7 | 9 | 29 | 20 | 32 | 59 | 38 | 13 | 226 |
| Total ... | 15 | 7 | 13 | 12 | 17 | 12 | 38 | 30 | 38 | 62 | 39 | 15 | 298 |

European and Asian cases originated from Coastal areas, the Lake district and Uganda.

Generally it is of interest to note that the peak period for all Nairobi recorded cases is in September-October. This is most unusual as the normal period is July. There is a very long lapse after the peak rainfall so that other climatic factors must be considered.

## Mosquito Data.

### Adult Collections—vector species.

Following case rates, the next fact of interest is the peak period of adult activity. The adult catch rate rises rapidly from May to June and July, the 27th week producing 224 adults from the 52 routine stations.

August was a very cold month and without a trace of rain. The rate falls rapidly away in August to September with no vector anophelines in October and November. The cold spell after the July peak appears to have been detrimental to adult activity with retarded sporozite development and unfavourable to malaria transmission. See graph page 60.

### A. gambiae caught in the fifty-two collecting stations.

(Per Week and Per Month.)

| | Jan. | Feb. | Mar. | Apr. | May | Jun. | July | Aug. | Sept. | Oct. | Nov. | Dec. | Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1st | 7 | — | 2 | 3 | 12 | 117 | 224 | 23 | 8 | — | — | — | |
| 2nd | 4 | 4 | 1 | 4 | 24 | 116 | 95 | 10 | 5 | — | — | 1 | |
| 3rd | 2 | 1 | 1 | 4 | 57 | 135 | 53 | 2 | 4 | — | — | — | |
| 4th | 1 | — | 3 | 10 | 86 | 123 | 43 | 9 | 2 | — | — | 1 | |
| | | | 2 | | | 122 | | | — | | | 1 | |
| Total for month | 14 | 5 | 9 | 21 | 179 | 613 | 415 | 44 | 19 | — | — | 3 | |

## VECTOR ANOPHELINE CATCHES.

(total numbers of both sexes caught)

| | Outer circle stations | | | | | | | | | | | | | | | | | | | | | inner circle stations | | | | | | | | | | | central stations | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Station | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | I | I | I | I | I | I | I | I | I | I | I | C | C | C | C | C | C | C | C | C | C | |
| Station Number | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 34 | 35 | 36 | 41 | 42 | 44 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | |
| January | 2 | — | 8 | 2 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1 | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 14 |
| February | — | — | 3 | — | — | — | 1 | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 5 |
| March | — | — | 4 | 1 | 1 | — | 3 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 9 |
| April | 7 | — | 5 | 2 | 1(F) | — | 4 | — | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 21 |
| May | 22 | — | 24 | 65 | 23 | 3 | 22<br>1(F) | 3 | — | 5 | 3 | — | — | — | — | — | — | — | — | 1 | — | — | 2 | — | 2 | — | 1 | — | 1 | 1 | — | — | — | — | — | — | — | — | — | — | — | 1 | 179 |
| June | 103 | 2 | 76 | 72 | 79 | 23 | 50 | 46 | 37 | 22 | 24 | 1 | 2 | 3 | 1 | — | 2 | 3 | 2 | — | 11 | — | 11 | — | 4 | — | 1 | 1 | 13 | 1 | 1 | 1 | 2 | — | 2 | 2 | 1 | — | 2 | 4 | 1 | 6 | 613 |
| July | 69 | 1 | 20 | 24 | 74 | 70 | 47 | 12 | 43 | 5 | 4 | — | — | — | — | 1 | — | 5 | 2 | 1 | 4 | — | 1 | 7 | 1 | 2 | 1 | — | 6 | 1 | 1 | — | 1 | 3 | 5 | 3 | — | 1 | — | — | — | — | 415 |
| August | 3 | — | — | — | 18 | — | — | 3 | 15 | — | 2 | — | — | — | — | — | — | — | — | — | — | 1 | — | — | — | — | — | — | 1 | — | 1 | — | — | — | — | — | — | — | — | — | — | — | 44 |
| September | — | — | 3 | 1 | 8 | — | — | 1 | 2 | — | — | — | — | — | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 3 | — | — | — | — | — | — | — | — | — | — | — | — | 19 |
| October | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| November | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| December | — | — | — | — | 2 | — | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 3 |
| | 206 | 3 | 143 | 167 | 206 | 96 | 129 | 66 | 98 | 32 | 33 | 1 | 2 | 3 | 2 | 1 | 2 | 8 | 4 | 2 | 15 | 2 | 16 | 7 | 7 | 2 | 3 | 1 | 21 | 6 | 3 | 1 | 3 | 3 | 7 | 5 | 1 | 1 | 2 | 4 | 1 | 7 | 1322 |

Total Outer Circle: 1219

Total Inner Circle: 69

Total Central: 34

F eq. A. funestus.

| | Eastern Stations | | | | | | | | | | | | | | | | | Western Stations. | | | | | | | | | | | | Southern Stations. | | | | | | | | | Northern Stations. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 28 | 50 | 51 | 52 | 27 | 26 | 25 | 23 | 22 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 35 | 34 | 33 | 32 | 12 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 30 | 31 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| January | 1 | 2 | 8 | 2 | — | — | — | — | — | — | — | — | — | 1 | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| February | 2 | — | 3 | — | — | — | 1 | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1 | 1 | — | — | — | — | — | — | — | — | — | — | — | — |
| March | — | — | 4 | 1 | 1 | — | 3 | — | — | — | — | — | — | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 3 | — | — | — | — | — | — | — | — | — | — | — | — |
| April | 7 | — | 5 | 2 | 1F | — | 4 | — | — | — | — | — | — | 2 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1 | — | 4 | — | — | — | — | — | — | — | — | — | — | — | — |
| May | 22 | — | 24 | 65 | 23 | 3 | 22<br>1(F) | 3 | 2 | — | — | 1 | — | 11 | — | 1 | — | — | — | — | — | — | — | — | — | 1 | — | 1 | — | — | 3 | 5 | — | 3 | 22<br>1(F) | 3 | 1 | — | — | — | — | — | — | — | — | 1 | — |
| June | 103 | 2 | 76 | 72 | 79 | 23 | 50 | 46 | 4 | 4 | 1 | 6 | 7 | 1 | — | — | 2 | 1 | 2 | 3 | 1 | — | 2 | 3 | 1 | 1 | — | 13 | — | — | 24 | 22 | 37 | 46 | 50 | 23 | 1 | 1 | 1 | — | 2 | 3 | — | — | 2 | — | 11 |
| July | 69 | 1 | 20 | 24 | 74 | 70 | 47 | 12 | 1 | — | — | — | — | — | — | 1 | 2 | — | — | — | — | 1 | — | 5 | 1 | 1 | — | 6 | — | — | 4 | 5 | 43 | 12 | 47 | 70 | 1 | — | — | 1 | — | 5 | — | — | 2 | 1 | 4 |
| August | 3 | — | — | — | 18 | — | — | 3 | — | — | — | — | — | — | 1 | — | — | — | — | — | — | — | — | — | 1 | — | — | 1 | — | — | 2 | — | 15 | 3 | — | — | — | — | — | — | — | — | — | — | — | — | — |
| September | — | — | 3 | 1 | 8 | — | — | 1 | — | — | — | — | — | — | — | — | — | — | — | — | 1 | — | — | — | — | 3 | — | — | — | — | — | — | 2 | 1 | — | — | — | — | 1 | — | — | — | — | — | — | — | — |
| October | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| November | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| December | — | — | 2 | — | — | — | 1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 3 | — | — | — | 1 | — | — | — | — | — | — | — | — | — | — | — | — |
| | 216 | 5 | 143 | 167 | 206 | 96 | 128 | 66 | 7 | 4 | 1 | 7 | 7 | 16 | 2 | 2 | 4 | 1 | 2 | 3 | 2 | 1 | 2 | 8 | 3 | 6 | — | 21 | — | — | 33 | 32 | 98 | 66 | 128 | 96 | 3 | 1 | 2 | 1 | 2 | 8 | — | — | 4 | 2 | 15 |

Total East: 1074

Total West: 49

Total South: 447

Total North: 34

As can been seen from the table there is an exceptionally steep rise from April to May, May to June, and a gradual drop to July, and a very sharp drop to August and September. This is the greatest number of *A. gambiae* taken in stations in Nairobi in any one year since 1937 and yet the year has the lowest case rate, but an unfortunately high mortality rate.

Striking also is the fact that the most prolific stations are those on the eastern boundary of the town, the inner ring of stations showing a fairly high catch, while the central stations remain low. The western stations are low despite being on the edge of the control.

From the tables it can be readily seen that outercircle stations produce the greatest number of vector anophelines, while there is a reduction in numbers at the inner and only a few in the central area stations. Also that the mosquito invasion potential lies to the east and south east of the town. The western area figure is probably accounted for by the fact that no control was carried out in the area around the stations. The prevailing wind is from the north east! There is little or no habitation to the south of the town, which area is Game Reserve and *A. gambiae* must therefore needs fly into the town in order to feed.

(Catching stations are arranged more or less to form a peripheral ring, an inner ring and central ring, and consist of 3 rooms or one large thatched room or shed and at least 5 residents. See map).

One station, No. 5, is of special interest as it consists of a large and a small cattle shed and boys quarters and has been sprayed a number of times with D.D.T. solution in kerosene by the farm owner. Station No. 2, the Ruaraka Police station lines, is also of interest, only 3 *A. gambiae* being taken in a year, the station is of modern construction, and the rooms white washed, light and airy. Stations 1 and 24 nearby have produced numbers of vectors.

### Non-Vector Anophelines.

Non-vector anophelines were strangely few in the Eastern peripheral stations though Culicine production was high. The most prolific non-vector anopheline stations were Nos. 17, 18, and 34 on the Western periphery and the uncontrolled section of the town. They also produced *A. gambiae*.

*A. funestus* was recorded one each from stations 5 and 7 on the eastern edge of the town.

*A. funestus* has been unable to obtain a footing in the town, but it is prolific just to the east in uncontrolled areas. It should be mentioned here that control by oiling (with searching) extends about one mile to the east of the township limit. The prevailing wind blows fairly constantly from the north-east. It is perhaps fortunate that the large open area of the Eastleigh aerodrome lies between the uncontrolled areas and the heavily populated central area of the Asian and African quarters. Should building as is envisaged, extend to the east around the Aerodrome, it is possible that the residents of the new areas will suffer appreciably from Malaria. As mentioned in the 1946 Annual Report, it is and will be more essential as the African locations extend eastwards, so to extend our control eastwards. Anti-adult work will become essential to give the locations any sense of freedom from malaria.

## Anophelines.

### Non-vector.

The table gives list of species and stations from which recorded (see map).

Nine species of non-vector anophelines were captured in adult stations, *A. demeilloni, christyi, and cinereus,* being the commonest. Of interest is the record of *A. pharoensis* from 3 stations. This is not a commonly recorded species from the Nairobi area.

| Species. | Stations. |
|---|---|
| A. demeilloni | 1. 3. 5. 7.9. 12. 14.15.17.18.19.20.23. 34.36.41.46 |
| A. christyi | 1. 3. 5.6.7.9. 13. 15.17.18. 34. 41. 51. |
| A. rufipes | 1. 3. 5. 34. |
| A. keniensis | 6. 17. 34. |
| A. cinereus | 1. 3.4.5. 7. 11. 15.17.18. 34.36. |
| A. coustani | 2. 5.6.7. 36. |
| A. pharoensis | 15. 32. 51. |
| A. squamosus | 5. 7. |
| A. marshallii | 18. |

### Larval Collections.

Remarkably few collections of *A. gambiae* were found, which speaks well of the oiling control. Records kept, from January to the end of the third week in October, of the weekly larvae searches, show only 39 collections. Of the 36 sections, only 15 produced larvae, and of these 7 only showed the presence of *A. gambiae* once.

Sections to the east of the town on the control edge produced the majority of *A. gambiae* foci. Sections 50 to 56 with 18 collections. The area around the Civil Aerodrome produced collections, this is to the south and on the edge of the control.

The town originally was divided in 48 sections, but 12 of these were cut out as at the beginning of the year from the area of control.

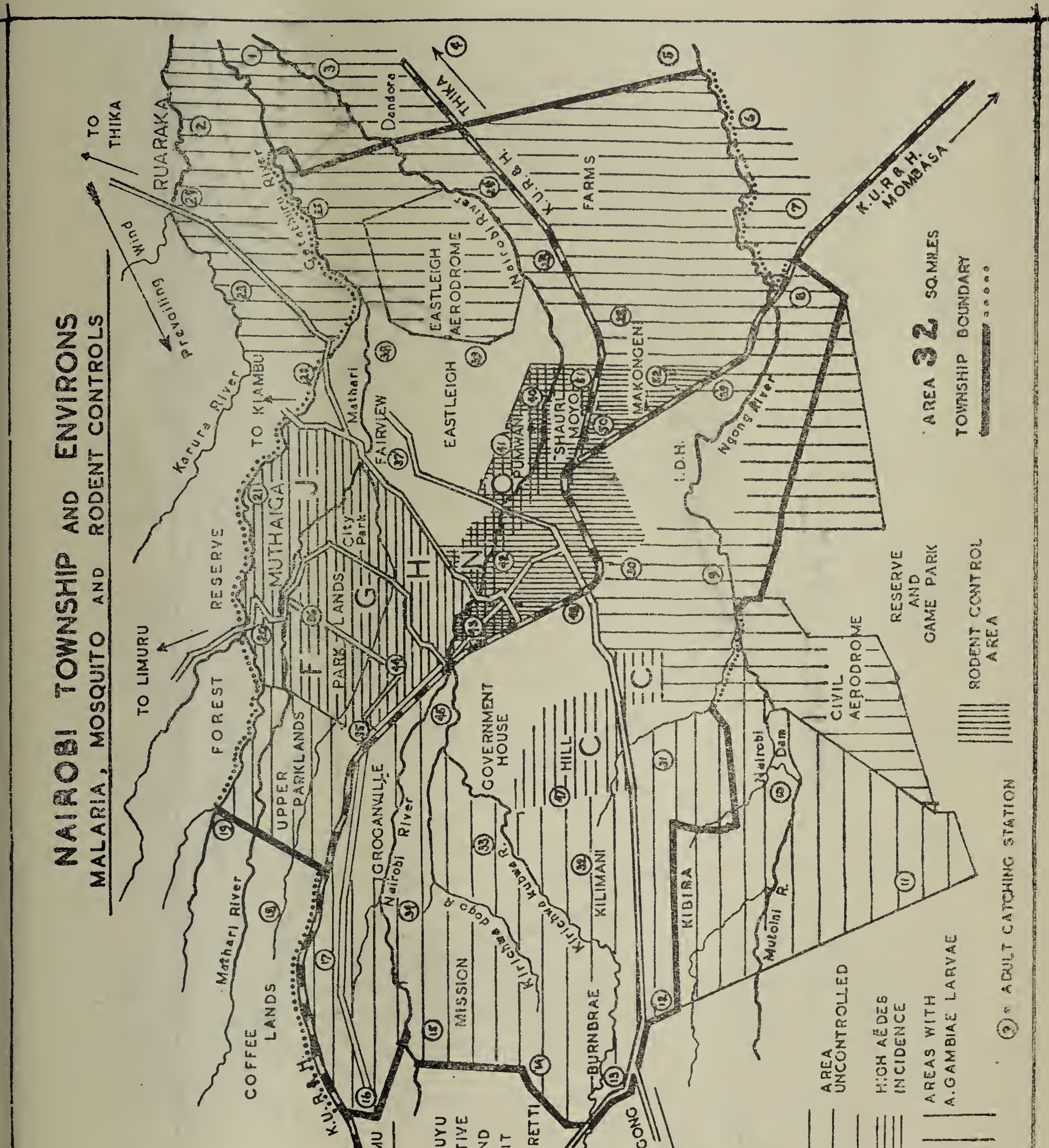
## Non-vector Anopheline Larvae Found

(By months and sections.)

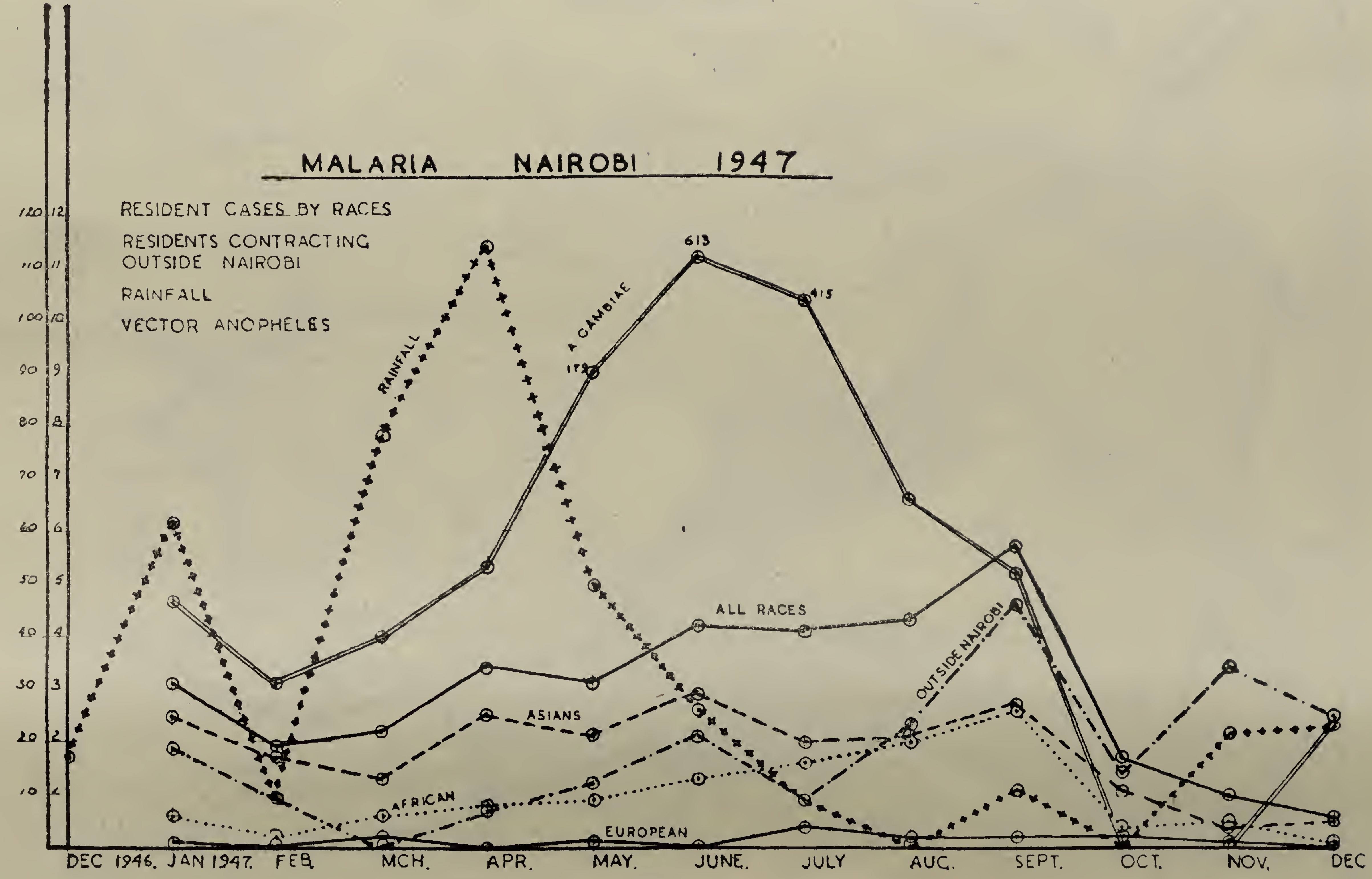
| | |
|---|---|
| *Anopheles sp. index.* | |
| 1st or 2nd stage. | |
| January | 21. 27. 29. 51. 52. 54. 56. Forest. |
| February | 27. 29. 51. 52. 54. Eastleigh. Forest. |
| March | 17. 20. 21. 51. 52. 54. 55. Eastleigh. |
| April | 15. 17. 21. 22. 50. 52. 53. 54. 55. Eastleigh. Forest. |
| May | 9. 16. 17. 18. 21. 27. 28. 29. 50. 53. 56. Eastleigh. Forest. |
| June | 7. 8. 9. 16. 18. 21. 27. 28. 30. 49. 51. 52. 53. 54. 55. Eastleigh. Forest. and Commercial. |
| July | 4. 5. 6. 10. 16. 21. 28. 31. 52. 53. 54. 55. 56. |
| August | 5. 17. 51. 56. |
| September | 7. 20. 22. 30. 56. Forest. |
| October | 5. 53. 54. Forest. |
| *A. christyi.* | |
| January | 17. 51. 56. |
| April | 21. |
| May | 8. 18. 20. 21. 24. 25. 52. 53. 54. 55. 56. Forest. |
| June | 4. |
| August | 21. 29. 52. 54. Forest. |
| September | 6. 51. Eastleigh. Forest. |
| October | 56. |
| *A. coustani.* | |
| January | 54. 56. |
| February | 54. |
| March | 54. |
| April | 49. 51. 54. |
| May | 7. 8. 10. 15. 16. 20. 21. 22. 28. 29. 30. 31. 49. 51. 52. 54. 55. 56. Civil Aerodrome. Eastleigh. Forest. |
| June | 6. 7. 10. 20. 21. 22. 24. 25. 29. 50. 51. 52. 53. 54. 56. Civil Aerodrome. Eastleigh. |
| July | 4. 7. 8. 16. 24. 29. 49. 51. 53. 54. 56. Civil Aerodrome. Commercial. Forest. |
| August | 4. 20. 52. 54. 56. Forest. |
| September | 51. 54. 56. |
| *A. natalensis.* | |
| January | Forest. |
| April | Forest. |
| August | Forest. |
| October | Forest. |
| *A. pharoensis.* | |
| April | 30. 49. |
| July | 51. 56. |
| *A. pretoriensis.* | |
| May | 30. 54. |
| June | 27. Civil Aerodrome |
| July | 54. Forest. |
| August | 52. |
| *A. demeilloni.* | |
| June | 16. 22. 24. 51. 52. Eastleigh. |
| July | 16. 20. 21. 24. |
| August | 24. 52. 56. Civil Aerodrome Forest. |
| September | 6. 56. |
| October | Forest. |
| *A. squamosus.* | |
| April | 21. 30. 54. |
| June | 56. |
| August | 54. |
| September | 27. |
| *A. cinereus.* | |
| April | 20. 28. |
| June | 53. |

Showing month and week of collection per section producing Larvae of *A. gambiae* (Vector Species).

| Month. | No. of week. | Sections |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  | 6. | 7. | 20. | 29. | 30. | 31. | 50. | 51. | 52. | 53. | 54. | 55. | 56. | Civil Aerodrome | Eastleigh Aerodrome | Forest |
| March | 11 |  |  |  |  |  | × |  | × |  |  |  |  |  |  |  |  |  |
| ,, | 12 |  |  |  |  | × |  |  |  |  |  |  |  |  |  |  |  |  |
| ,, | 13 |  |  | × |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| May | 18 |  |  |  |  |  |  | × |  |  |  |  | × |  |  |  |  |  |
| ,, | 19 |  |  |  |  |  |  |  |  |  |  |  |  |  |  | × |  |  |
| ,, | 20 |  |  |  |  |  |  |  |  |  |  |  |  | × |  |  |  |  |
| ,, | 21 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | × |
| June | 23 |  |  |  |  |  |  |  |  | × |  |  |  |  |  |  |  |  |
| ,, | 24 |  | × |  |  |  |  |  |  |  |  | × |  |  |  |  |  |  |
| ,, | 25 |  |  |  |  |  | × |  |  |  |  |  | × |  |  | × |  |  |
| ,, | 26 |  |  |  |  |  |  |  |  |  |  |  |  |  | × |  | × |  |
| July | 27 |  |  |  |  |  |  |  |  | × |  | × |  | × |  | × |  |  |
| ,, | 28 |  |  | × |  |  |  |  |  | × |  |  |  |  |  | × |  |  |
| ,, | 29 |  |  |  |  |  |  |  |  |  |  |  |  |  | × | × |  | × |
| ,, | 30 |  |  | × | × |  |  |  |  | × |  |  |  |  |  | × |  |  |
| August | 32 |  |  |  |  |  |  |  |  |  |  |  |  |  | × |  |  |  |
| ,, | 33 |  |  |  |  |  |  |  |  | × |  |  |  |  |  |  |  | × |
| ,, | 34 |  |  |  |  |  |  |  |  |  |  | × | × |  |  |  |  |  |
| ,, | 35 |  |  |  |  |  |  |  |  |  | × |  |  |  | × |  |  |  |
| Sept. | 37 |  |  |  |  |  |  |  |  |  |  |  |  | × |  |  |  |  |
| October | 42 |  |  |  |  |  |  |  |  | × |  |  |  |  |  |  |  |  |
| TOTALS :— |  |  | 1 | 3 | 1 | 1 | 2 | 1 | 1 | 3 | 1 | 3 | 3 | 3 | 4 | 6 | 1 | 3 |



NAIROBI TOWNSHIP AND ENVIRONS
MALARIA, MOSQUITO AND RODENT CONTROLS



MALARIA NAIROBI 1947

## Yellow Fever.—Aedes (Domestic) Mosquito Control.

As was the case with Malaria Control, a considerable proportion of the town was excised from the control area at the start of the year, and furthermore, the whole domestic mosquito control organisation was withdrawn on Council's instructions, during the 45th week, so that records of work are only up to the 14th November. During October, Council entered upon an experimental control scheme, which resulted in 500 houses being left unsearched for a period of four weeks during October.

The years working shows a considerable increase in the Aedic index with a decline in the number of premises searched and foci examined, and a great increase in the numbers of *Aedes aegypti* found compared with previous years.

The excision of parts of the town is an unsound policy and one which needs immediate rectification if mosquito control in the township is to be efficient, and it is more than unwise to permit of a "let up" at any time in any section of the township.

Again it has unfortunately to be repeated that no scavenging or tree-hole filling was carried out during the year, this on account of the considerable cut in estimates, which precluded the engagement of staff. It is inconsistent that foci such as tins and drums should be dealt with while natural foci of the vector species are omitted.

In view of the alarming increase in the Aëdes index it is all too obvious that a full scale control is essential, and that all aspects of the mosquito control should be re-instated with the utmost alacrity.

Military camps have not been the menace they were in 1946, due primarily to the fact that many camps were sold and demolished.

Nevertheless the camps that remained required constant attention. The aftermath of the war has been the setting up of salvage dumps and as reported in 1946, these dumps gradually became shifted and the junk dispersed by innumerable junk dealers who set up a great number of small businesses throughout the town in the most unsuitable premises and locations, including the residential areas. The owners of these junk dumps are extremely difficult to trace, and there appears no means available to stop their unwholesome and unhygienic activities, which simply add to the difficulties of keeping the town clean, and free from mosquitoes and rats.

Prosecutions could have been increased, but the time factor has been a very great hindrance, firstly the time involved in preparing the case and obtaining evidence, secondly the court has only been able to give one afternoon a week to Municipal cases with the result that

Mosquito By-law contravention cases have had to take their chance against all other cases taken by the Council's Prosecutor.

## The Aedes Index.

The focus potential steadily increases year by year instead of diminishing and the year under review has not seen any lessening of the potential, in fact the work has increased greatly, if only from the fact that buildings have greatly increased resulting in more compounds to be littered with foci.

The index for 1947 is 0.17%, which does not compare very favourably with the figures for the past 7 years which were as follows:—

| 1940. | 1941. | 1942. | 1943. | 1944. | 1945. | 1946. | 1947. |
|---|---|---|---|---|---|---|---|
| per cent | per cent | per cent | per cent | per cent | per cent | per cent | per cent |
| 6.3 | 1.47 | 0.41 | 0.09 | 0.08 | 0.08 | 0.07 | 0.17 |

The total premises searched were 249,862 during the period, a low figure when compared with previous years.

**Total Premises Searched and Index.**

| | Total Premises Searched. | Average per week. | Aedes Index. per cent |
|---|---|---|---|
| 1944 | ... 262,704 | 5,052 | 0.08 |
| 1945 | ... 385,254 | 5,485 | 0.08 |
| 1946 | ... 332,521 | 6,463 | 0.07 |
| 1947 | ... 249,862 | 5,674 | 0.17 |

In all, records show that during the year, the number of premises to be searched per week, increased by 39 over the December 1946 figure in the area of the control. Foci searched numbered 1,096,207 compared with 1,500,983 and 1,542,570 for 1946, and 1945 respectively. The index to foci is 0.04%.

These figures show a considerable reduction on potential foci per compound per annum, comparative figures being:—

| 1943. | 1944. | 1945. | 1946. | 1947. |
|---|---|---|---|---|
| 195 | 271 | 273 | 238 | 193 |

but it is to be noted that only a proportion of the Town was under control. Residential areas to the west were uncontrolled.

**Aedes aegypti** were found breeding in 434 foci of which 383 were temporary foci such as tins, drums, tyres and the like. This is a great increase on the total foci for 1946, which was 269.

**Permanent and Temporary Foci.** As will be readily seen from the accompanying table the temporary foci by far exceed the permanent foci. This can be partly accounted for by the higher rainfall during the year when compared with the other years, whereby temporary foci were produced.

During 1947, permanent foci produced 51 collections of *A. aegypti* compared with 65 and 69 for 1946 and 1945 respectively. Whereas temporary foci showed the remarkable increase to 383 compared with 204 and 197 for the preceeding two years.

By Permanent Foci is meant all foci which retain a suitable breeding liquid throughout the year and are not dependant an rainfall. The temporary foci are all dependant on rainfall and therefore only produce breeding during the rainy season.

Theoretically Domestic control should be easy and the Domestic mosquito readily eliminated, but in practice there are so very many obstacles to surmount. The temporary foci are due to sheer carelessness on the part of the public who appear to feel that the mosquito, like malaria is a necessary evil of the tropics to be put up with and in many cases breeding in the permanent foci is due to sheer inattention and apathy on the part of householders. However, a fully waterborne sewage system based on an adequate water supply could soon remedy the position as there would be no need for such foci as Septic Tanks and rain water storage tanks.

## TABLE OF INDICES.

(Relative significance of permanent and temporary foci.)

| | Larval species found (times) | | | | | Larval species found (per cent) | | | |
|---|---|---|---|---|---|---|---|---|---|
| Permanent Foci. | No. examined | Aedes aegypti | Anopheles | Culex | Total all species | Aedes aegypti | Anopheles | Culex | Total all species |
| | | | | | | per cent | per cent | per cent | per cent |
| Rainwater Tanks ... | 20,884 | 33 | — | 26 | 59 | .15 | — | .13 | ,28 |
| Septic Tanks ... | 47,738 | — | 1 | 99 | 100 | — | .002 | .20 | .21 |
| Soakage Pits ... | 22,161 | — | — | 166 | 166 | — | — | .75 | .75 |
| Sunken Drums and Bath Pits ... | 14,515 | 5 | 1 | 74 | 80 | .03 | .007 | .51 | .55 |
| Gully Traps ... | 145,239 | 11 | — | 81 | 92 | .007 | — | .05 | .06 |
| Earth Drains ... | 81,671 | — | 3 | 289 | 292 | — | .003 | .35 | .35 |
| Concrete Drains ... | 252,630 | 2 | — | 89 | 91 | .0008 | — | .03 | .03 |
| TOTAL ... | 584,838 | 51 | 5 | 824 | 880 | .009 | .0008 | .14 | .15 |
| Temporary Foci ... | 511,369 | 383 | 3 | 1212 | 1598 | .07 | .0005 | .23 | .31 |
| GRAND TOTAL ... | 1,096,207 | 434 | 8 | 2036 | 2478 | .04 | .0007 | .18 | .22 |

The decrease, in certain areas, of the house figures for 1947 is the result of the excision of certain areas from the control.

Once again the residential areas have produced the majority of *Aedes aegypti.* Muthaiga and Parklands giving the highest figures.

Note that the *A. aegypti* figure is double that for 1946. It would appear that owners of very large gardens are incapable of keeping their plots free from tins, doubtless thrown out by their African servants, for more than 112 collections of Aëdes were found in these containers. Rainwater Storage tanks were also fruitful, 24 contained *A. aegypti* larvae. Tins provided a further 33 foci in other residential areas, 26 tree holes contained *A. aegypti* in the residential area and these trees represent only about 15% of the total trees in the township area, the remaining 85% not being examined.

In general there was a very considerable increase in *Aedes aegypti* breeding during the year, from 269 collection in 1946 to 434 for 1947, however, the Culicines other than *Aedes aegypti* dropped very slightly a matter of 50 collections from 2,087 in 1946 to 2,036 in 1947. As usual Eastleigh area produced the greatest number, 335 collections, followed by Fairview 202 and the Commercial Factory area 192. Principal breeding foci being earth drains, hollows and depressions, soakage pits and septic tanks. Small containers such as drums, and tyres produced together 259 collections.

In the residential area, soakage pits, septic tanks, sunken drums to collect bath water, earth drains and scrap junk formed the principal foci.

Breeding in water-meter "boxes" constructed by the Council and others is all too prevalent—it appears ridiculous that premises be furnished with a breeding receptacle—in many cases these boxes are below ground level and collect seepage and are incapable of being drained. The following are the figures for the past three years:—

1945—65: 1946—205: and 1947 212 with Culicines

12 with *Aedes aegypti* and 1 with anophelines.

**Index.** The Focus index is 0.04 per cent and 0.18 per cent for *Aedes aegypti* and all culicines respectively, both figures being an increase on those for 1946, which were 0.01 per cent and 0.13 per cent. All species index being 0.22 per cent compared with 0.15 per cent for 1946.

The first table gives the principal data for the various sections of the town, compared with the 1946 figures, the second gives the principal foci for the main areas of the town, and the third, against the types of foci searched, gives the number and species of larvae found.

## FOCI BREEDING PER BLOCK AND INDICES.

| Block | Increase over 1946 | No. of Houses 1946 | No. of Houses 1947 | Aedes aegypti 1946 | Aedes aegypti 1947 | Anopheles 1946 | Anopheles 1947 | Culex 1946 | Culex 1947 | Total all species 1946 | Total all species 1947 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A. Burnbrae E. | | 200 | — | 14 | — | | | 61 | — | 75 | — |
| B. Kilimani E. | | 172 | 48 | 18 | 29 | | | 105 | 23 | 123 | 52 |
| C. Hill Area E. | | 246 | 243 | 7 | 19 | | 3 | 136 | 190 | 143 | 212 |
| D. Hill Area E. | | 244 | 222 | 23 | 16 | 4 | 3 | 124 | 85 | 151 | 104 |
| E. Groganville E. | | 223 | — | 18 | — | 1 | | 41 | — | 60 | — |
| F. Upper Parklands E.A. | | 258 | 165 | 49 | 84 | | 1 | 147 | 73 | 196 | 158 |
| G. Parklands A. | 6 | 272 | 278 | 30 | 80 | | 1 | 136 | 192 | 166 | 273 |
| H. City Park A. | | 410 | 391 | 26 | 36 | | | 120 | 108 | 146 | 144 |
| J. Muthaiga E. | 4 | 185 | 189 | 53 | 102 | | | 95 | 148 | 148 | 250 |
| K. Commercial Mixed | | 212 | 208 | — | 5 | | | 55 | 59 | 55 | 64 |
| L. Commercial A. | | 212 | 208 | — | — | | | 34 | 23 | 34 | 23 |
| M. Commercial A. | | 300 | 295 | 2 | 4 | | | 62 | 82 | 64 | 86 |
| N. Ngara A. | | 517 | 485 | — | 14 | | | 166 | 148 | 166 | 162 |
| O. Pumwani N. | | 528 | 523 | — | 13 | | | 96 | 102 | 96 | 115 |
| P. Pumwani N. | | 434 | 423 | 1 | — | | | 15 | 9 | 16 | 9 |
| Q. Racecourse A. | | 539 | 532 | 1 | 1 | | | 51 | 50 | 51 | 51 |
| R. Fairview A. | 26 | 310 | 336 | 11 | 18 | 1 | | 172 | 202 | 184 | 220 |
| S. Eastleigh A. | | 309 | 344 | 3 | 6 | | | 272 | 335 | 275 | 341 |
| T. Farms E.A. | | 5 | 5 | 3 | 2 | | | 20 | 7 | 23 | 9 |
| U. P.W.D. Mixed | | 733 | 732 | — | 3 | | | 90 | 192 | 90 | 195 |
| V. Eastleigh A.N. | 3 | 20 | 23 | 1 | 1 | | | 14 | 6 | 15 | 7 |
| X Kabete E. | | 112 | — | — | — | | | 67 | — | 76 | — |
| Y Government House Mixed | | 22 | 22 | 1 | 1 | | | 8 | 2 | 9 | 3 |
| | | 6463 | 5672 | 269 | 434 | 6 | 8 | 2087 | 2036 | 2362 | 2478 |

Note:—E. European Area. A. Asian Area. N. Native Area.

## District and Principal Foci. A. aegypti and Other Culicines.

| Districts:— | B | C | D | F | G | H | J | K | L | M | N | O | P | Q | R | S | U |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Septic Tanks |  | 0/17 | 1/10 | 0/2 | 0/36 |  | 0/29 |  |  |  |  |  |  |  |  |  |  |
| Rainwater Tanks | 4/2 | 1/1 | 3/0 | 8/1 | 1/1 |  | 15/7 | 0/4 |  |  | 1/0 |  |  |  | 0/1 |  | 0/6 |
| Sunken Drums |  | 0/14 | 0/8 | 0/2 | 1/4 |  | 0/1 |  |  |  | 0/2 |  |  |  |  |  | 6/1 |
| Bathwater Pits | 0/2 | 0/18 | 0/3 | 0/2 | 0/3 | 1/0 | 3/10 |  |  |  |  |  |  |  |  |  |  |
| Drums | 1/1 | 2/10 | 2/7 | 2/3 | 6/21 | 5/13 | 0/7 | 2/6 | 0/2 | 0/9 | 1/12 | 1/22 | 0 |  | 3/16 | 1/12 | 1/37 |
| Soakage Pits |  | 0/2 | 0/4 | 0/1 | 0/20 | 0/2 | 0/2 |  |  | 0/2 |  |  |  | 0/9 | 0/44 | 0/75 |  |
| Earth Drains | 0/5 | 0/34 | 0/13 | 0/23 | 0/24 | 0/11 | 0/13 | 0/2 |  | 0/6 | 0/5 | 0/3 |  | 0/19 | 0/2 | 0/97 | 0/31 |
| Concrete Drains |  | 0/5 | 1/2 | 1/5 | 0/7 | 0/21 | 0/7 | 0/7 |  | 0/4 | 0/2 |  | 0/1 |  | 0/16 | 0/6 | 0/4 |
| Gully Traps | 1/0 | 0/2 | 2/4 | 0/5 | 0/13 | 0/10 | 7/4 | 0/12 | 0/2 | 0/3 |  | 0/10 |  |  | 0/8 |  |  |
| Tins | 15/3 | 8/3 | 2/2 | 3/9 | 46/16 | 8/3 | 35/4 |  |  | 0/10 | 3/7 | 4/8 |  | 1/0 | 3/3 | 0/4 | 0/5 |
| Tyres |  |  | 3/0 | 4/1 | 8/10 | 3/11 | 3/2 | 0/2 | 0/2 | 1/8 | 5/44 | 2/17 |  | 0/6 | 7/27 | 2/12 | 1/13 |
| Motor Parts |  |  |  | 11/4 | 6/2 | 4/4 | 1/8 | 0/2 | 0/2 | 0/4 | 1/8 | 2/4 |  | 0/2 | 2/11 | 3/4 | 0/5 |
| Jars, Bottles | 1/0 |  |  | 4/2 | 2/0 |  | 1/0 |  |  |  | 0/2 | 3/11 |  |  | 1/0 |  |  |
| Hollows |  | 0/34 | 0/4 |  |  | 1/9 | 1/7 | 0/3 | 0/3 | 0/16 | 0/9 | 0/7 | 6/2 | 0/2 | 1/25 | 0/27 | 0/54 |
| Pots |  | 2/0 | 2/1 |  |  | 10/2 | 7/0 |  |  | 0/2 |  |  |  |  |  |  | 0/2 |
| A. R. P. Shelter |  |  |  |  |  |  |  |  |  |  | 0/6 |  |  |  |  |  |  |
| Duck Ponds |  | 0/6 |  | 1/1 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Baths |  | 1/2 |  |  |  |  | 1/1 |  |  |  |  |  |  |  |  |  |  |
| Bird Baths |  | 1/0 |  | 3/0 |  |  | 7/2 |  |  |  |  |  |  |  |  |  | 0/2 |
| Buckets |  |  |  | 1/2 | 2/1 | 1/2 | 2/0 |  |  | 0/3 | 1/1 |  |  |  | 1/0 |  | 0/4 |
| Water Meter Boxes | 1/2 | 0/5 | 0/10 | 1/1 | 0/9 | 0/6 | 4/2 | 3/9 | 0/6 | 0/6 | 1/36 | 0/8 | 0/2 | 0/6 | 0/24 | 0/71 | 1/7 |
| Hot Water Tanks | 1/0 | 1/1 | 4 | 4/0 | 1/1 | 1/1 | 1/1 | 0/3 |  |  | 0/2 | 0/2 |  |  |  |  |  |
| Sumps |  |  |  |  |  | 0/2 |  | 0/3 |  |  |  |  |  |  |  |  | 0/3 |
| Holes |  | 1/0 |  | 1/6 |  |  |  | 1/5 |  | 0/3 |  | 1/0 |  |  | 0/2 | 0/3 |  |
| Troughs |  |  |  |  |  |  | 5/4 |  |  |  |  |  |  |  |  |  |  |
| Tree Holes |  | 3/0 | 2/0 | 2/0 | 4/0 | 1/0 | 7/0 |  |  |  |  |  |  |  |  |  |  |
| Hand Grips |  |  |  |  | 2/0 |  | 2/0 |  |  |  |  |  |  |  |  |  |  |
| Sisal |  |  |  |  | 5/0 |  |  |  |  |  |  |  |  |  |  |  |  |

Aedes aegypti/Culicines.

## Potential Foci Searched and Larvae Found.

| | Potential Foci | Larvae Found C. | A. | AN. |
|---|---|---|---|---|
| Plants not specified | 1,671 | — | — | — |
| Sisal | 23,222 | — | 5 | — |
| Bamboos | 340 | — | — | — |
| Cacti | 2,163 | — | — | — |
| Bananas, cultivated | 69,284 | — | — | — |
| Bananas, wild | 2 | — | — | — |
| Tree Holes | 10,046 | — | 18 | — |
| Coconut Shells | 131 | — | — | — |
| Palms | 504 | — | — | — |
| Unspecified | 2,335 | — | — | — |
| Soakage pits | 22,161 | 166 | — | — |
| Baths | 828 | 10 | 2 | — |
| Bird Baths | 5,445 | 5 | 9 | — |
| Rubbish Pits | 224 | 20 | — | — |
| Troughs | 3,444 | 7 | 6 | — |
| Karais | 4,055 | 8 | 1 | — |
| Water Meters | 6,146 | 229 | 12 | 1 |
| Buckets | 8,248 | 14 | 8 | — |
| Basins | 1,402 | — | — | — |
| Pots | 1,479 | 13 | 23 | — |
| Wells | 1,245 | 42 | — | — |
| Air Raid Shelters | 28 | 6 | — | — |
| Fish Ponds | 848 | 25 | 2 | 2 |
| Hot Water Tanks | 3,195 | 14 | 10 | — |
| Cement Tanks | 1,560 | 16 | 1 | — |
| Underground Tanks | 194 | — | — | — |
| Hand Grip in Inspection Covers | 458 | 1 | 2 | — |
| Egg Shells | 94 | — | — | — |
| Wheelbarrows | 19 | — | — | — |
| Barrels | 964 | 13 | 4 | — |
| Cooling Tanks | 446 | — | — | — |
| Batteries | 636 | 2 | 3 | — |
| Holes | 244 | 26 | 2 | — |
| Sumps | 1,390 | 13 | — | — |
| Rainwater Tanks | 20,884 | 26 | 33 | — |
| Septic Tanks | 47,738 | 99 | — | 1 |
| Sunken Drums/Bath Pits | 14,515 | 74 | 5 | 1 |
| Gully Traps/Road Gullies | 145,239 | 81 | 11 | — |
| Guttering | 3,769 | — | — | — |
| Earth Drains | 81,671 | 289 | — | 3 |
| Concrete Drains | 252,630 | 89 | 2 | — |
| Tins | 137,604 | 81 | 164 | — |
| Drums | 124,087 | 190 | 32 | — |
| Bottles/Jars | 6,898 | 11 | 12 | — |
| Tyres | 53,252 | 159 | 38 | — |
| Motor Parts | 30,213 | 59 | 30 | — |
| Hollows | 3,256 | 238 | 4 | — |
| Total ... | 1,096,207 | 2,036 | 434 | 8 |
| Total all species | | | 2,478 | |

## General Culicine Breeding.

This section refers to breeding of species other than *Aedes aegypti*. The majority of species being *Culex pipiens*, *C. fatigans*, *C. duttoni*, *C. (Lutzia) tigripes*, *Aedes vittatus* and *A. pulchrithorax* and a few other uncommon species.

There was a very slight decrease in the number of Culicines found, 2,036 collections as compared with 2,087 for 1946. Principle foci as will be seen from preceding tables were earth drains, these carrying sullage and kitchen waste water, 289 collections. Sullage disposal is a major problem in domestic control as house holders seldom take much heed of the general sullage drainage on the plot. Hollows or depressions in gardens and road sides, account for 238 collections. Water meters 229 collections. Tins and drums 271 collections. We are still suffering from the effects of the war when tinned foodstuffs were issued in large quantities, tins are scattered everywhere throughout the town and gathering of the foci should be given a high priority and the resuscitation of the very effective tin collecting gang should be sanctioned at once. During the period October to December, when Aedes control was withdrawn and the unit system adopted a small gang collected tins in a few small areas of the town and picked up no less than 69,871 tins and scrap. Bottles and jars, like tins were favoured foci. Old motor tyres collected by salvage and junk merchants and stored anyhow in the open, proved a fruitful source of breeding, no less than 159 collections being made. Soakage pits and Septic tanks produced 265 collections of Culicines, the majority of these as will be noted from table 3, were in the Fairview Eastleigh area and Parklands Muthaiga. The former due to poor soakage and the latter to defective gauze on the F.A.I. of the tanks. Other principle foci were concrete drains, blocked or unswept or silted, also gullies and road gullies 81. The collection of bath water in special pits or in 45 gallon drums sunk in the ground produced 74 collections. These latter foci are all intimately connected with drainage and water supply. Good drainage and water supply could eliminate the majority of these foci since there would be a proper sewage system and no necessity to store water. Rainwater storage tanks produced 26 collections.

There can be no let-up in the Domestic Control, since to the public a mosquito is a mosquito whatever its species or its its malaria or yellow fever transmission capabilities, and is therefore a nuisance to be controlled. The majority of mosquito complaints received by the department are referable to Culicine breeding usually in some part of the drainage system. Species sanitation cannot be allowed to become the rule, as the public demands mosquito control in the widest sense.

**Military Camps.** The Council was responsible for the control in military camps and on the whole did not secure great co-operation or assistance from the army due in the main to the fact that personnel were so often changed, leaving no individual responsible for camp hygiene. Conditions were an improvement on 1946, but nevertheless were bad when compared with the town as a whole as nobody would accept responsibility for them: Military Camp figures are given below:

The camps and establishments under control varied from 74 at the beginning of the year to 46 at the end of the year. Total camp searches numbered 1,477. Weekly indices ranged from 0.0 per cent to 8.5 per cent for Aedes and 11.1 per cent to 53.6 per cent for Culicines, in all 704 collections of larvae were found. (Anopheles) 13, *Aedes aegypti* 24 and Culicines 667, an average of 15 collections per week, from an average of 32 camps per week searched.

Chief foci were, as in the case of the town, connected with drainage, grease traps provided 216 collections, gullies 58, Cement storage pits and tanks 18, concrete drains 37, earth drains 63. Table 4 gives the foci and species. Of interest is the anopheline breeding in motor vehicle scrap.

**MOSQUITO BREEDING—MILITARY CAMPS.**

| | Larvae found | | |
|---|---|---|---|
| | Anopheles. | Culicines. | Aedes aegypti. |
| Rain Pools and Swamps ... | 2 | 42 | — |
| Grease Traps ... | — | 216 | 1 |
| Bath Pits ... | — | 22 | — |
| Gully Traps ... | — | 58 | — |
| Sunken Drums ... | — | 15 | — |
| Tree Holes ... | — | 2 | 3 |
| Tins ... | — | 23 | 9 |
| Concrete Drains ... | — | 37 | 1 |
| Drums ... | — | 78 | 5 |
| Cement Pits/Tanks ... | — | 18 | — |
| Earth Drains ... | 5 | 63 | — |
| Septic Tanks ... | — | 12 | — |
| Foot Prints ... | 1 | — | — |
| Tanks ... | — | 2 | — |
| Buckets incl/Fire ... | — | 21 | 1 |
| Undetermined ... | 1 | 16 | 6 |
| Holes ... | — | 8 | 1 |
| Tarpaulins ... | — | 6 | 1 |
| Water Meter Containers ... | — | 9 | 1 |
| Tyres ... | — | 1 | — |
| Motor Vehicle Scrap ... | 4 | 13 | — |
| Totals ... | 13 | 662 | 29 |

TOTAL:—704

## Houses and Inspections.

A resume of the town control method is as follows.

The town is divided into a number of sections, each section being searched by 2 African Inspectors. One headman looks after 2 sections or 4 inspectors and one Senior headman checks the work of 3 headmen. The European Inspectors counter check the work of all the men.

The cycle is based on 5 days, Monday to Friday, when every premise within the town is searched. Saturdays are reserved for camp inspections.

Each inspector averages approximately 25 premises per day. In some cases fewer and in others many more, particularly in the African location and housing areas, where an inspector may have a hundred houses. Many new buildings were erected during the year with the result that the inspectors had more houses to check. During the period October to December many new houses were erected which so far have never been taken into the control since they were not in the original control area.

Total premises were 5,672 compared with 6,463 for 1946, when the whole township area was under control.

A system of house cards was adopted in the residential area. These cards were of considerable advantage to the house-holder and inspectors. All inspectors initialed the card after inspection and marked up the card when breeding was located, so that a householder could check the inspection and eliminate the breeding or breeding place. It is to be regretted that the cards were withdrawn in October when the unit system was enforced.

Numbering of houses should be carried out, this would greatly facilitate the work and would be of the greatest benefit to the public, particularly Medical practitioners and tradesmen. So very often a complainant states he lives somewhere in such and such a road and cannot give a land registration number and time is wasted while a search is made for the house. For infectious diseases control and malaria in particular house numbering would be of the very greatest advantage. Cases can be located and marked accurately.

## Rodent and Vermin Control.

One of the Mosquito Inspectors, Mr. J. Morrill, was transferred to take over the duties of Rodent Officer, and much improvement has resulted. A small gang of Africans, under an intelligent headman have carried out all the routine inspections and control work, together with general vermin control.

### General.

Rodent control has received much lip service in the past but little money has been forthcoming to implement measures suggested. A full time Rodent Officer is essential, and he should be given an adequate staff, and funds, as it will be seen from the plan (appendix), that only a very small portion of the town has been brought into the control, and it is quite impossible to do more with the existing staff. The rodent problem is serious, as the damage caused by rats is extensive and costly while the threat of plague is always present, since Nairobi is on the edge of the endemic area, Kiambu, which annually records human and rodent plague. The general overcrowding and squalid conditions of parts of the town today, provide the rat and plague, with every facility for a major epidemic. The rat must be given no respite, no harbourage, no food, and a properly conducted campaign, backed by adequate funds, could bring the pest to such a low point that plague should never become a serious problem.

The original survey of 1944-1945 has continued to be the base upon which the work has been conducted. This survey showed the main infestation area of the town, including the African locations. Much progress can be reported, both in control and prevention. The work falls into five categories. Inspection of premises, with institution of preventive measures, by notices and prosecution of defaulters; trapping and poisoning with gassing and hand catching; trapping as a check with inspections; routine control; complaints of infestation, inspection and control. Traps have come in freely, but there is still difficulty in obtaining adequate stocks of poison. For baits any materials available are used, meat, grain, floor sweepings, flour, and other foodstuffs. The bait position has not been entirely satisfactory, and supplies of a good bait material are urgently required.

### Plague.

No cases of plague occurred in the township, but a close watch was kept, as the endemic Kiambu area produced nine human cases, with three deaths, and one case of rodent plague.

Total rats killed during the year (not gassed, or poisoned).

| | |
|---|---|
| Black Rat, *Rattus rattus kijabius* ... ... ... | 3,604 |
| Black Rat, *Rattus rattus frugivorous* ... ... ... | 132 |
| White footed Rat, *Mastomys coucha panya* ... ... | 5,050 |
| Field Rat, *Arvicanthis abyssinicus* ... ... ... | 5,203 |
| Short-tailed Swamp Rat, *Otomys angoniensis* ... | 249 |
| Mice, *Mus musculus* ... ... ... ... ... | 1,508 |
| Others (*Dendromus*, *Leggadia*, etc.) ... ... ... | 14 |
| | 15,820 |

The following are details of control in the various sectors of the town.

**Kariokor and Ziwani.** Rooms trapped, 1,493.
Kariokor, 75 of 84 houses, or 89% with rats.
Ziwani, 29 of 134 houses, or 21.6% with rats.

| | |
|---|---|
| Rattus rattus kijabius ... ... ... ... ... | 232 |
| Rattus rattus frugivorous ... ... ... ... | 14 |
| Mastomys coucha panya ... ... ... ... | 5 |
| Mus musculus ... ... ... ... ... ... | 83 |
| | 334 |

These are brick and stone structures with no ceilings. Harbourage is amongst the great accumulation of boxes, kikapus, and general junk, kept by these Africans. There is some evidence of rats entering from the outside.

**Pumwani.** Rooms trapped, 3,178.

448 of 454 houses, or 98.6% infested with rats.

| | |
|---|---|
| Rattus rattus kijabius ... ... ... ... ... | 316 |
| Rattus rattus frugivorous ... ... ... ... | 2 |
| Mastomys coucha panya ... ... ... ... | 8 |
| Mus musculus ... ... ... ... ... ... | 85 |
| | 411 |

This is an African built location, the majority of buildings, being rooms which amount to cubicles only. Rat harbourage is good, and warrens and burrows exist at the base of the wall, from where they can travel by burrows, through the wall structure.

**Shauri Moyo.** Rooms trapped, 1,082.

175 houses of 6 rooms. 24 houses of 2 rooms.

168 of 199 houses, on 84.4% infested with rats.

| | |
|---|---|
| Rattus rattus kijabius ... ... ... ... ... | 48 |
| Mus musculus ... ... ... ... ... ... | 444 |
| | 492 |

These rooms are reasonably built structures, of stone, corrugated iron roof, and concrete plinth. Rats have only harbourage, and do not breed in the rooms. They only enter for food. Mice are a perpetual nuisance and breed in the accumulation of rubbish, kept in the rooms. These buildings are more or less lodging houses.

**Kaloleni.** Rooms trapped, 276.

33 of 92 houses, or 35.8% infested with rats and mice.

| | |
|---|---|
| Rattus rattus kijabius ... ... ... ... ... | 13 |
| Mus musculus ... ... ... ... ... ... | 28 |
| | 41 |

New modern buildings of stone, and tile roofs. No harbourage exists.

**Marulani.** Rooms trapped, 600.
96 of 100 houses, or 96% infested with rats and mice.

| | |
|---|---|
| Rattus rattus kijabius ... ... ... ... ... | 44 |
| Mastomys coucha panya ... ... ... ... ... | 2 |
| Mus musculus ... ... ... ... ... ... | 375 |
| | 421 |

Temporary structures of bituminised grass matting on forest poles, and beaten murram floors. Mice have holes, and runs under the murram floor and along the bituminised edges.

**Poisoning.** Baits were laid on the normal prebaiting system. Various poisons were used from time to time. Most of the poisoning work was carried out in open areas, and godowns, where there was little chance of food becoming contaminated. Poisoning often followed trapping, which was only used as an indication of type of rats, and infestation rate.

Baits were laid in containers, or in heaps, or pills, in the open, and sometimes in buildings. In many instances, baits were placed in a novel type of bait container. These were speedily and cheaply made, by the African carpenter. Domestic animals, etc. could not gain access to the bait, but rats readily used these containers.

The following areas were treated:—

All African locations, Godown and railway siding area of Sadler Street. Race Course area, where there are hundreds of tons of scrap and salvage material in large dumps. Nairobi Swamp area now abondoned as a market garden, and very over grown, on which there are many unauthorised buildings, and scrap heaps. Godown area and railway siding of Whitehouse Road.

| | |
|---|---|
| Poison baits laid .. | 70,394 |
| Poison baits taken .. | 18,870 |

564 bodies of poisoned rats were recovered. It is possible that each of the 18,000 baits accounted for a rat.

**Gas.** Cyanide gas, in the form of Calcium Cyanide Powder, was used in a special foot pump. Holes and warrens were treated, at many points throughout the town, where ever the Inspector considered the danger of gas was negligible to humans. River and drain banks, received particular attention, also road and bridge embankments, and termite nests, the latter being a favourite place for *Mastomys*, and sometimes for *Rattus*.

208 warrens were treated. The kills in these operations were high, judged by the results of warrens opened up after treatment.

**Hand Catching and Digging.** These methods proved of value, and gave some very interesting data. Hand catching was employed in a number of large premises, particularly those handling grain and other boxed, baled, or bagged goods, the goods being shifted gradually, from one side of the building to the other, and so concentrating the rats into a corner, where the catchers were quickly able to gather, and kill them.

Hand catching, with driving, or digging, was also employed with success, in open grass and weed-grown areas, 11,580 rats being taken, of all species, though the majority were *Mastomys* and *Arvicanthis*.

The following table shows the result of work in suitable areas:—

| | Kariakor | Pumwani | Shauri Moyo | Kaloleni | Marulani | Abattoir | Swamp | Ngara | Commercial | |
|---|---|---|---|---|---|---|---|---|---|---|
| Rattus rattus kijabius | 10 | 118 | 163 | 33 | — | 360 | 319 | 81 | 31 | 1115 |
| Rattus rattus frugivorous | — | — | — | 1 | — | 7 | 2 | — | — | 10 |
| Mastomys coucha panya | 29 | 70 | 674 | 133 | 3 | 109 | 3081 | 756 | 40 | 4895 |
| Arvicanthis abyssinicus | 67 | 908 | 1032 | 491 | 116 | 163 | 1241 | 785 | 386 | 5189 |
| Otomys angoniensis | 8 | — | 9 | 1 | — | 5 | 101 | 89 | 31 | 244 |
| Mice | — | 19 | 32 | 13 | — | 2 | 33 | 9 | 7 | 115 |
| Others | — | 1 | — | — | — | — | 5 | 3 | 3 | 12 |
| Totals | 114 | 1116 | 1910 | 672 | 119 | 646 | 4782 | 1733 | 498 | 11580 |

**Inspections.** Inspections are being concentrated for the time being in premises, storing or handling foodstuff, bulk or retail, although other premises, obviously infested, have not been neglected.

In all, 77 "Foodstuff". premises were closely inspected, and 65 notices were served, to rat proof these buildings. Sixteen prosecutions, for failing to comply with the notices, were heard, and 14 convictions secured. Fines totalling 1,085|- being imposed.

The Rodent Officer inspected many more premises, and intimated verbally that various anti-rodent measures should be adopted, and in many cases voluntary compliance was obtained.

**Foodstuff Inspection.** During inspections it was noted that much foodstuff was contaminated by rat excreta, and that by the time a Food Inspector could be obtained to examine the food, it had mysteriously disappeared from the premises. To combat this, the Rodent Officer was empowered to seize foodstuff, under Section 132, cap. 124, of the Public Health Ordinance, when all contaminated food seized, was certified by a Magistrate, as unfit for human consumption, and condemned.

Of the major items seized and condemned were 12 hams, 379 lbs. sugar, 260 lbs. flour, and 30 lbs. dried fruit. Many items in small quantities were seized, or voluntarily given up.

**Rat Proofing.** The service of notices to rat proof, had to be curtailed somewhat, as it was found that it was not always possible to comply, since essential materials were controlled, and in short supply, such as cement, galvanised sheet metal, and coffee tray wire. There has been, without a doubt, some reluctance to try and find materials, and in many instances, shoddy workmanship, and crude materials were employed, in an effort to defeat the terms of the notice, and obtain a cheap result. This naturally was not permitted. It is hard to persuade people who have lived with rats, of the necessity for rat proofing for the protection of their goods and buildings. In many instances it is impossible to adequately rat proof some buildings which are old and dilapidated, and the only course available, is for the demolition of the building. This action however, can seldom be applied, owing to the shortage of premises.

Now that many new buildings are being erected, it is essential that these be made proof, and the By-laws require strengthening so as to make it compulsory, to put in anti-rat devices with each new building. There is a gross lack of appreciation of the ability of a rat to affect an entry into a building.

**Complaints, and Requests for Rodent Destruction.** Fifty complaints of rat infested buildings, were received and dealt with, yielding the following:—

Buildings examined 50.

| | |
|---|---|
| Rattus rattus kijabius ... ... ... ... ... | 463 |
| Rattus rattus frugivorous ... ... ... ... ... | 28 |
| Mastomys coucha panya ... ... ... ... ... | 97 |
| Arvicanthis abyssinicus ... ... ... ... ... | 2 |
| Mice ... ... ... ... ... ... ... | 60 |
| Dendromus ... ... ... ... ... ... | 2 |

Experience shows that *Mastomys coucha panya*, is adapting itself more and more, and becoming a house frequenter. This is serious, as the species is known to carry the vector flea, and to suffer from plague.

Dendromus is difficult to control, as it usually enters houses via creepers and other plants growing against walls, and it seldom makes nests in buildings. The public is usually unwilling, to cut down creepers.

In some cases, the keeping of poultry under shocking conditions, under houses on piles, or in a series of boxes within tiny runs, encourages rats, and many of the infestations of dwellings, were traced to this source.

**Rodent Inspection.** Ruiru Dam Construction Camp.

As plague had occurred in the Kiambu Reserve, adjacent to the area in which Council maintained a large labour camp for employees, working on the Ruiru Dam, a small team of Africans was sent out to inspect the camp, and to carry out anti-rodent work during the period May 13th-26th.

In all, 53 *Rattus rattus kijabius* were killed.

**Plague Examination.** A certain number of the daily rat catch from each area is examined but no positive *B. pestis* has been found in 6,984 specimens.

A number of "found dead" specimens were also examined.

**Flea Examinations.** Examination of all rats is carried out, and two records kept, fleas from live rats, and fleas from trapped rats.

| | |
|---|---|
| Number of live rats examined ... ... ... | 10,379 |
| Number of rats with fleas ... ... ... | 323 or 3.1 per cent |
| Number of fleas all species ... ... ... | 638 |
| Number of fleas per rat ... ... ... ... | 1.94 |

| Species of Rats. | Species of Fleas. | | | |
|---|---|---|---|---|
| | X. braziliensis | X. cheopis | Others | Total |
| Rattus rattus kijabius ... | 81 | 123 | 93 | 309 |
| Rattus rattus frugivorous ... | 1 | 1 | 1 | 3 |
| Mastomys coucha panya ... | 9 | 12 | 53 | 74 |
| Avicanthis abyssinicus ... | 33 | 53 | 135 | 221 |
| Otomys angoniensis ... | 5 | 3 | 18 | 26 |
| Mice ... | 2 | — | 3 | 5 |
| Total ... | 143 | 192 | 302 | 638 |

**Vermin Control.** The rodent gang is also employed in general disinfestation and disinfection work.

**Bedbugs** have as usual been the subject of considerable complaint, and the gang disinfested 177 rooms, and lots of furniture. D.D.T., and Cyanide being used.

**Cockroaches** have also been dealt with, in a number of premises, D.D.T. and Sodium Fluoride, being used.

**Bats.** Complaints of bat infestation of buildings, have been numerous, and some success has been achieved by using Cyanide Gas, to which they readily succumb.

**Disinfection** of 207 rooms, was carried out after infectious diseases had been treated.

**Smallpox.** A minor outbreak of smallpox occurred outside Nairobi during the month of May. Vaccination posts were set up at road junctions, and all persons entering Nairobi from the affected areas were vaccinated. This involved the cessation of approximately 90% of anti-rodent work during the period 8th May to 4th June. During this period the Vermin Control gangs, vaccinated 48,738 persons. Isolated cases of Smallpox, occurred during October, and November, and 226 contacts were vaccinated.

## LABORATORY

Greater use of the Laboratory by the Health Department Child Welfare Clinics, is reflected in the number of specimens examined during the year.

A first class African Laboratory Assistant is responsible for most of the work, and he has taken great interest, and care in all his work.

Towards the end of the year, the Laboratory undertook the examination of material from the V.D. Clinics, which greatly increased the work, and greatly speeded up diagnosis for the Clinics.

Some difficulty has been experienced in obtaining essential stains, and re-agents, which has not made the work any easier.

The following gives details of examinations made during the year:—

| | |
|---|---|
| BLOOD FILMS. | |
| Counts | 6 |
| PARASITES. | |
| Negative | 1156 |
| Sub-Tertian | 382 |
| Sub-Tertian crescents | 72 |
| Benign Tertian | 43 |
| Mocrofilaria bancrofti | 1 |
| Microfilaria perstans | 1 |
| Spirillum duttoni | 1 |
| G. C. SMEARS. | |
| Negative | 884 |
| Positive | 61 |
| Eye Negative | 7 |
| Eye Positive | 2 |

| | |
|---|---|
| **STOOLS OVA & CYSTS.** | |
| Negative | 146 |
| Ascaris | 44 |
| Taenia | 17 |
| Strongyloides | 1 |
| Ancylostoma | 12 |
| Trichuris | 6 |
| S. mansoni | 4 |
| E. histolitica | 2 |
| **URINE TESTS** | 9 |
| **SPUTUM.** | |
| T.B. | 2 |
| **DARK GROUND.** | |
| Negative | 7 |
| S. pallidum | 6 |
| **RODENT EXAMINATION.** | |
| B. pestis Negative | 6984 |
| Blood Smears (parasites) | 6984 |
| Spirochaetes | 4 |
| Trypanosomes | 447 |
| Trichinella (negative) | 6984 |

# AFRICAN MATERNITY HOSPITAL

This year has seen many changes at the hospital, at the beginning there were 8 staff nurses, three Pumwani-trained three from the Mombasa training school and two from Uganda. All were working quite well. Two trainees had sat for the Government examination in December, one passed and returned to the hospital as staff nurse and the other failed and left. The last three months of 1946 had brought many applications from would be trainees, from whom we accepted seven new candidates in January 1947, three of them Kikuyu, 2 Kakamega, 3 Mangure and one Marigoli. All of these seven are working well and passed the nursing examination at the end of the year.

## Shauri Moyo Annexe.

Staff Nurse Dora was in charge at the Annexe and the other staff nurses did duty there for two months at a time; there was also an Ayah and a Dhobi on the African staff.

Towards the end of the first six months of the year there was so much unrest, amongst staff-nurses in particular, at the Annexe that it was deemed desirable to close it at the end of June, dismissing all staff nurses except Dora who is now working at the hospital. In the circumstances it was decided that an oral examination in midwifery should be held, for trainees who had finished their 18 months training making those who passed responsible for carrying out staff-nurse duties in the wards. At the first examination in June, eleven candidates passed and the scheme of making them ''Charge Seniors'' is working well; it gives them a sense of responsibility which will be valuable to them on passing out to other hospitals.

Also in June two more candidates sat and passed the Government examinations, and both left to work elsewhere.

During the year there has been a marked increase in the girls from all tribes applying for training and there is now a waiting list of 40 applicants. In July we admitted 8 new candidates for training but one left after three months, to get married.

At the beginning of 1948 there will be 12 new candidates admitted for training, the extra numbers being necessary to run the new hospital when it is opened.

## European Staff.

The year opened with a full staff of Europeans, Medical Superintendent, Matron and three Nursing Sisters. However, one nursing sister left through ill health and had not been replaced at the end of the year (though her relief is expected in January 1948). During some of the months we were helped out by a married nursing sister who served us nobly, but the ever-increasing number of patients made it obvious that a fourth nursing sister would be required. This was approved in October; we hope she will arrive early in 1948.

The Welfare Committee of African Missions and Social Services hold meetings from time to time to consider suggestions regarding trainees. The Welfare Worker at the hospital arranges the trainees' food and supervises outings and general recreation.

## General.

Both the numbers of patients and the birth rate increase monthly. New wards have now been built and will be opened on January 1st 1948, which will give the hospital a total of 46 beds, and will equip it to nurse and treat all cases of Venereal disease and abortion.

The average length of stay of each patient is still only two days, but it should be possible to increase this to five in the new year.

The general outline of the new Maternity Hospital was approved in November and at the turn of the year detailed plans are just being started. The sum of £30,000 has been set aside for the new building and will provide for 72 beds in three wards of 24 beds each, besides a theatre and every other facility. The preliminary sketches show that the new hospital, which will be built on a plot of land across the road opposite the present one, will be an immense improvement. The old building will be used, after reconditioning and conversion, as a Nurses Home.

**Summary.**

| | | |
|---|---|---|
| Admissions: Resident | 1123 | Total 2210 |
| ,, Non-Resident | 1087 | |
| Patient Days | 9780 | |
| Baby days | 7705 | |
| Motherless Baby days | 795 | |

**Admissions, by Tribes.**

| | Clinic | Direct | Total |
|---|---|---|---|
| Kikuyu ... | 995 | 461 | 1456 |
| Jaluo ... | 285 | 63 | 348 |
| Other Tribes ... | 288 | 118 | 406 |
| Total ... | 1568 | 642 | 2210 |

**African Midwives under Training.**

| | |
|---|---|
| in January | 24 |
| in July | 30 |

**Ante-Natal Clinic.**

| | | | | |
|---|---|---|---|---|
| New Cases. | Resident | 1203 | | |
| | Non-Resident | | 2102 | |
| Repeats. | Resident | 1827 | | |
| | Non-Resident | | 3124 | |
| | | 3030 | 5226 | Total 8256 |

**Post Natal Clinics.**

| | | |
|---|---|---|
| Resident cases | 464 | |
| Non-resident cases | 285 | |
| | | Total 749 |

**Admissions by Districts.**

| | | | |
|---|---|---|---|
| Nairobi ... | 1123 | Athi River ... | 12 |
| Kabete ... | 459 | Dagoretti ... | 20 |
| Limuru ... | 79 | Ngong ... | 44 |
| Uplands ... | 14 | Karen ... | 7 |
| Kikuyu ... | 12 | Langata ... | 22 |
| Kiambu ... | 94 | Magadi ... | 2 |
| Kijabe ... | 5 | Ruaraka ... | 30 |
| Naivasha ... | 5 | Ruiru ... | 13 |
| Gilgil ... | 3 | Juja ... | 3 |
| Nakuru ... | 1 | Thika ... | 79 |
| Elburgon ... | 1 | Mangu ... | 8 |
| Njoro ... | 1 | Kahawa ... | 9 |
| Lumbwa ... | 1 | Fort Hall ... | 91 |
| Maji Mazuri ... | 1 | Nyeri ... | 30 |
| Mbagathi ... | 1 | Machakos ... | 20 |
| Embu ... | 1 | Tumu Tumu ... | 1 |
| Makuyu ... | 1 | Karatina ... | 1 |
| Kisumu ... | 4 | Karura ... | 11 |

## MATERNAL DEATHS.

| Cause | Clinic | Direct | Total |
|---|---|---|---|
| Placenta Praevia ... ... | 1 | — | 1 |
| Cerebral Thrombosis ... ... | 1 | — | 1 |
| Exhaustion with Sepsis ... ... | 1 | 1 | 2 |
| Septicæmia ... ... | 1 | 2 | 3 |
| Gangrenous Bladder ... ... | — | 1 | 1 |
| Ruptured Uterus ... ... ... | — | 5 | 5 |
| Prolonged Labour with exhaustion ... | — | 1 | 1 |
| | 4 | 10 | 14 |

## CAUSES OF INFANT DEATHS.

| | Clinic | Direct | Total |
|---|---|---|---|
| Prematurity ... ... ... | 17 | 18 | 35 |
| Patent Foramen Ovale ... ... | 2 | 1 | 3 |
| Congenital Pyloric Stenosis ... | 1 | — | 1 |
| Malnutrition ... ... ... | 3 | — | 3 |
| Congential Syphilis ... ... | 12 | 2 | 14 |
| Erythroblastosis ... ... | 1 | — | 1 |
| Congenital Heart Disease ... ... | 2 | — | 2 |
| Birth Injuries ... ... ... | 2 | 2 | 4 |
| Spina Bifida ... ... ... | 1 | — | 1 |
| Arteritis ... ... ... | 1 | — | 1 |
| Semi-headed monster ... ... | 1 | — | 1 |
| Diarrhœa ... ... ... | 1 | — | 1 |
| Asphyxia ... ... ... | 2 | 1 | 3 |
| Encephalitis and mumps ... ... | 1 | — | 1 |
| Septicæmia ... ... ... | 2 | 2 | 4 |
| Intracranial Hæmorrhage ... | 1 | 1 | 2 |
| Atelectasis ... ... ... | 1 | — | 1 |
| Hæmorrhagic Diseases of the new born | — | — | — |
| Toxæmia ... ... ... | 2 | 2 | 4 |
| Cerebral Hæmorrhage ... ... | 2 | 1 | 3 |
| Hydrops Fœtalis ... ... ... | — | 1 | 1 |
| Mongolian Idiot ... ... ... | — | 1 | 1 |
| Total ... | 55 | 32 | 87 |

## CAUSES OF STILLBIRTHS.

| | Clinic | Direct | Total |
|---|---|---|---|
| Placenta Praevia ... ... | 3 | — | 3 |
| Congenital Syphilis ... ... | 9 | 2 | 11 |
| Asphyxia Neonatorum ... ... | 13 | 5 | 18 |
| Obstructed Labour ... ... | 4 | 5 | 9 |
| Delayed Breech ... ... ... | 1 | 1 | 2 |
| Birth Injuries ... ... ... | 6 | 14 | 20 |
| Spina Bifida ... ... ... | 1 | — | 1 |
| Anencephalic Monster ... ... | 1 | 2 | 3 |
| Macerated Fœtus ... ... | 4 | 6 | 10 |
| Delivered under untoward circumstances | 1 | — | 1 |
| Delayed Labour ... ... ... | 4 | 1 | 5 |
| Prolapsed Cord ... ... ... | 7 | 8 | 15 |
| Craniotomy ... ... ... | 1 | — | 1 |
| Prematurity ... ... ... | 5 | 3 | 8 |
| Eclampsia ... ... ... | 1 | — | 1 |
| Erthroblastosis ... ... ... | — | 2 | 2 |
| Transverse presentation ... ... | — | 1 | 1 |
| Malpresentation ... ... | — | 1 | 1 |
| Hydrocephalus ... ... ... | — | 1 | 1 |
| Intrauterine Trauma ... ... | — | 1 | 1 |
| Sepsis ... ... ... | — | 1 | 1 |
| Total ... | 61 | 54 | 115 |

## OPERATIONS.

| | Clinic | Direct | Total |
|---|---|---|---|
| Caesarean Section ... ... | 49 | 9 | 58 |
| Forceps ... ... ... | 21 | 13 | 34 |
| Laporatomy ... ... ... | — | 1 | 1 |
| Version ... ... ... | 6 | 7 | 13 |
| Decapitation ... ... ... | — | 3 | 3 |
| Manual Removal of Placenta ... | 4 | 6 | 10 |
| Repair of Perineum (Major) ... | 7 | 1 | 8 |
| Induction of Labour ... ... | 1 | — | 1 |
| Craniotomy ... ... ... | 6 | 10 | 16 |
| Incision of abscess ... ... ... | 1 | 1 | 2 |
| Vertical incision of Vulva ... ... | 2 | — | 2 |
| Currettage ... ... ... | 4 | 7 | 11 |
| Application of Willett's Forceps ... | 2 | — | 2 |
| Tapping uterus ... ... ... | 1 | — | 1 |
| Circumcision ... ... ... | 1 | — | 1 |
| Resuture of wound ... ... ... | — | 1 | 1 |
| Cystotomy ... ... ... | — | 1 | 1 |
| Hysterectomy ... ... ... | — | 2 | 2 |
| Replacement of uterus ... ... | — | 3 | 3 |
| Total ... | 105 | 65 | 170 |

| | Clinic | Direct | Total |
|---|---|---|---|
| Normal Live Births ... ... ... | 1246 | 387 | 1633 |
| Twin Births ... ... ... | 21 | 3 | 24 |
| Abnormal Presentations ... ... | 62 | 32 | 94 |
| Total Live Birth ... ... ... | 1329 | 422 | 1751 |
| Still Births ... ... ... | 61 | 54 | 115 |
| Born before arrival ... ... | 29 | 29 | 58 |
| Abnormal cases treated (i.e. Abortions, intercurrent diseases and puerperal sepsis) | | | 255 |

## EUROPEAN CHILD WELFARE

Child welfare clinics have been held at the Lady Northey Home on Wednesdays from 2 - 4 p.m., from the beginning of August.

| | |
|---|---|
| Total number registered ... ... | 6 |
| Re-weighings ... ... | 10 |
| Anti-diphtheria inoculations ... ... | 14 |
| Vaccinations ... ... | 31 |
| T.A.B. ... ... | 20. |

At the close of the year a start is being made on the new European Day Nursery and Clinic at Parklands, which it is hoped will be ready for opening in about September.

## AFRICAN MATERNITY AND CHILD WELFARE.

### Staff.

It was with much regret that this Department said good-bye to Dr. Mary Graham-Johnstone at the end of May, when she went to Somaliland to join her husband; she had worked with energy and keen interest for the preceding eleven months. Dr. J. A. T. Henry was appointed to replace her with effect from 26th May, 1947.

Although there were six Health Visitors on the staff until the end of November, when Mrs. A. Davies resigned there were 154 days lost from sickness and 35 from staff being seconded to other work. Mrs. Dugmore, Supervisor of Health Visitors, did duty for the greater portion of this relief work. The African Clinic Assistant Assinati, Grade C, carried the entire responsibility of the work at Kaloleni for many weeks.

From the African establishment of 12 assistants 117 days were lost from sickness and one assistant was granted 2 months maternity leave without pay. In the opinion of the Supervisor of Health Visitors there has been a marked improvement in the work of the African staff during the year.

### Review of Activities.

Antenatal Clinics. The total attendances at the five clinics has increased by 973 as compared with 1946 and new cases have increased by 413. One of the good features about these attendances is that in many cases mothers come in the early months of pregnancy without being invited.

Venereal disease still forms a major problem, many of the woman only come to Nairobi for short periods, either for the birth of one infant or the conception of another and then go back to their Reserves. If during their stay in the town they are found to be suffering from V.D. the chances of their being able to undergo a long protracted course of anti-syphilitic treatment are very remote; in some cases they do not understand the necessity for maintaining treatment over a length of time. Every care is being taken to co-operate with the V.D. clinic by visiting defaulters and trying to persuade them to go for treatment.

Although the number of postnatal examinations has increased the relative numbers themselves are small. In contrast to this great lack of interest in the postnatal state is the enormous enthusiasm for the gynaecological clinic, conducted by Dr. P. G. Preston, M.R.C.O.G. This was transferred from the V.D. clinic to Kariokor clinic on 12th November. This enthusiasm is closely related to the African Bibi's dominating need for children. In former times barren women received the harshest possible treatment and the tradition and social stigma attaching to this state of affairs dies hard even to-day, hence the enthusiasm for the gynaecological examinations and treatment.

During 1947 total registrations at this clinic were 290 of which 619 were referred to the Native Civil Hospital for treatment. When considering the health of African women the importance of this clinic cannot be over estimated.

**Child Welfare Clinics.** Anyone interested in this work would have had a delightful bird's eye view if he had attended the Baby Show held in January at the Pumwani Social Hall and in November at the Kaloleni Social Hall when the silver cup given by Mr. Coleman and presented to the winner by Lady Mitchell went to Kariokor clinic on the former and to Kaloleni clinic on the latter occasion.

The standards of home care and hygiene have risen considerably due to home visits and to the propaganda arising from good work in the clinics, but we are still faced with the grave problem of how to help the sick children without the teaching aspects of the work being seriously reduced. This is particularly true of the two Railway locations of which the population moves to and from the Reserves in large numbers and of which almost every child contracts malaria and scabies when in their Reserves.

We are hoping to adjust the establishment of this Department to allow every clinic to have a Grade C African Clinic Assistant. That is a literate qualified midwife, who may or may not have obtained her general training certificate.

The patience and persistence of the Health Visitors is of a very high standard in the face of much disappointment mainly due to the lack of co-operation amongst the mothers in not bringing their children to the clinics, in failing to carry out instructions regarding regular taking of medicines and by lapses in home hygiene.

In 1947 as compared with 1946 the new cases in 0-1 year group increased by 140 and in the 1-5 year group increased by 319. An effort is being made by the Medical Officer in charge of the clinics to help with the health of the Nursery School children, attending Municipal and Railway schools, by examining each child at least every two months and referring him for any treatment considered to be necessary. Diet deficiency and care is a major problem with the location children mainly in the protein and vitamin foods, in spite of the free issue of milk.

**Medical Aspects.** Measles was prevalent in all of the locations during the second half of the year (it was rather earlier in Makongeni) and was particularly bad in both of the Railway Locations, partly due to the children having malaria at the same time. Because of this the Makongeni Nursery School was closed for one month. Several cases of broncho-pneumonia occurred. Whooping cough commenced in Kaloleni in August and reached a peak in November and early December. There have also been smaller epidemics in the other locations. There is a continuous supply of malaria and scabies varying in numbers with the outgoing and incoming of people from and to the reserves, chickenpox, gastro-enteritis, conjunctivitis and skin diseases were other complaints recurring in appreciable numbers. The following is a summary of immunisations and results of examinations.

| | |
|---|---|
| Vaccinations ... ... ... ... | 1,327 |
| T.A.B. inoculations ... ... ... ... | 2,650 |
| Total No. of children examined by M/O on return from Reserves ... ... ... ... | 1,348 |
| Enlarged spleens ... ... ... ... | 682 |
| Positive malaria ... ... ... ... | 300 |
| Scabies ... ... ... ... ... | 397 |
| Ringworm ... ... ... ... ... | 72 |

The housing question in the locations brings the same report from all the Health Visitors, inadequate and over-crowded. Where descriptions of houses state "for 2 men" or "for 4 men" one is more accurate in reading "families" in place of "men". Water and sanitation shortages are also grave problems.

**District Midwives.** As from April 18th three Municipal district midwives were appointed in Kariokor, Railway Landhies and Makongeni locations. That the work has continued smoothly and without incident, testifies to the efficient and detailed plans which were made for this service by Dr. Graham-Johnstone and Mrs. Dugmore.

It is disappointing that more of the mothers in Ziwani do not use the Kariokor midwife as it would relieve the demand for hospital accommodation.

### District Midwives.

| Details of cases. | Kariokor. | Makongeni. | Railway Landies. |
|---|---|---|---|
| Normal delivery living child | 29 | 54 | 19 |
| Normal delivery dead child | — | — | — |
| Abnormal delivery living child | 2 | — | — |
| Abnormal delivery dead child | — | — | — |
| Perineal sutures | 3 | 3 | 1 |
| Infant deaths | 1 | 2 | — |
| Post natal examinations | 24 | 37 | 9 |

Infant deaths were due to:—1. Congenital syphilis, mother refused to attend for treatment.

2. Prematurity.

3. Foetal heart feeble when born, midwife called-died before ambulance arrived.

If the high standard of this domiciliary midwifery service is maintained it will be a very valuable asset to the mothers and infants because the midwives can achieve so much by teaching and practical demonstrations in the home in addition to their obstetrical practice.

The new clinic at Kaloleni is not yet complete but if the areas of the Public Works Department, Infectious Diseases Hospital, Narura, and the Police Lines develop as planned then this promises to be a busy clinic. It is the only clinic which is at present not working to capacity, whereas any further increase of work at the other clinics will necessitate increase of European and African staff.

After going carefully into the problem of getting the essential information about the duties of fatherhood over to the African men (see last years report page 60) it was decided that as the male—and in particular the African male—diffidence (or perhaps conceit) about attending classes or groups devoted to this subject might prove insuperable, the most profitable means of approach would be through the vernacular press and through the men's organisations run by the African Affairs Officer.

| | Pumwani | Kariokor | Kaloleni | Makongeni | R. Landhies | 1944 | 1945 | 1946 | 1947 |
|---|---|---|---|---|---|---|---|---|---|
| **Antenatal.** | | | | | | | | | |
| Total Attendances | 984 | 950 | 552 | 1,102 | 1,049 | 3,312 | 2,567 | 3,664 | 4,637 |
| New Cases | 159 | 332 | 204 | 262 | 227 | 470 | 536 | 771 | 1,184 |
| Births at Home | 51 | 91 | 36 | 148 | 96 | 282 | 337 | 282 | 422 |
| Births in Hospital | 32 | 104 | 39 | 37 | 64 | — | — | — | 276 |
| Left Nairobi before delivery | 97 | 83 | 32 | 43 | 64 | — | — | — | 319 |
| **Infant Welfare.** | | | | | | | | | |
| 0 - 5 years Total | 11,798 | 7,664 | 3,126 | 5,705 | 5,530 | 40,820 | 39,518 | 33,949 | 33,823 |
| 0 - 1 year New Cases | 344 | 411 | 205 | 309 | 223 | 748 | 1,226 | 1,352 | 1,492 |
| 0 - 1 year transferred to Pre-school register | 87 | 29 | 30 | 22 | 79 | — | — | — | 247 |
| 1 - 5 years New Cases | 193 | 359 | 199 | 374 | 212 | 934 | 1,353 | 1,018 | 1,337 |
| **Home Visits.** | | | | | | | | | |
| By Health Visitors | 1,949 | 2,461 | 1,886 | 1,579 | 1,417 | 9,212 | 6,612 | 10,384 | 9,292 |
| By African Staff | 2,018 | 5,742 | 1,909 | 2,272 | 3,217 | 10,218 | 10,140 | 11,054 | 15,158 |
| Total Home Visits | | | | | | 19,430 | 16,752 | 21,438 | 24,450 |
| **Dispensary.** | | | | | | | | | |
| Total Attendances | 6,339 | 7,747 | 2,936 | 4,289 | 11,462 | 23,336 | 7,002 | 12,850 | 32,773 |
| Women | 794 | 1,797 | 636 | 879 | 740 | — | — | — | 4,846 |
| Children | 5,545 | 5,950 | 2,300 | 3,410 | 10,722 | — | — | — | 27,927 |

## ASIAN MATERNITY AND CHILD WELFARE.

### Staff.

There are several changes in staff to record. Dr. Soushila Soule left at the beginning of the year and Dr. Mary Graham-Johnstone carried out Dr. Soule's duties in addition to her own until the appointment of Dr. Vohra. Dr. Vohra left towards the end of the year and Dr. Margaret Bax was appointed in her place.

### Health Visitors.

There were only two trained Health Visitors to carry on the work of the three Asian Clinics during the greater part of the year since Miss Priscilla Benjamin was away on overseas leave. Mrs. Savitra Bhaskare carried on the work at Ngara Centre in place of Miss Benjamin, and Mrs. Savitra Chaddah looked after the Pangani Centre. When Mrs. Shakkar Shariff left at the beginning of the year Miss Jena Sidi Mohamed, Health Assistant, carried on the work at the Sandeford Road Clinic under the direct supervision of the Medical Officer.

## CLINICS

### Ngara Road Centre.

This is the oldest of the three centres and the busiest on account of its situation. Being built in the Asian Maternity Hospital Grounds it is most convenient for getting help from the public in order to facilitate follow-up work. It is situated on 5 bus routes and is, therefore, the obvious centre for most of the mothers in the Asian area.

### Sandeford Road Centre.

This is the standard type of Welfare Centre built for the purpose but, of course, on a fairly small scale. By its situation in the Commercial Road area beyond the Railway its scope is limited to the comparatively few Asians who live in that somewhat isolated area and whose menfolk work on the Railway.

The building itself belongs to the Railway.

### Pangani Centre.

This building is nominally a temporary one designed to draw off some of the extra load from Ngara Road.

## REVIEW OF ACTIVITIES

### Home Visiting.

The basic service in the Child Welfare Oraganisation is that of teaching the mother to take care of her own health and that of her children. In this respect the most useful function of the clinics, though the least spectacular, is that of home visiting, as in this way we can teach by example in the homes, and in time the lives of the mothers and their environment and family circumstances may be studied by the Health Visitors.

The soundest policy in the long run might have been to begin the health service with extensive work in a limited area, but, however, the whole population demands the service of Health Visitors once the principle has been accepted, and then a shortage of staff makes it extremely difficult to carry out intensive work in any one area. The best that can be done is to spread the available staff as equitably as possible over the Asian areas. Again, because staff are short, efficient follow-up work is difficult.

The most thickly populated area, round River Road, has at present no centre and the mothers in that area find it difficult to attend any of the other centres, Ngara Road being separated from the River Road by the extent of the Swamp.

### Ante-Natal Work.

The primary aim of this work is to ensure that the mother is fit for childbirth, the secondary but still important consideration being that of taking the opportunity to teach the mother to look after the expected child.

Weekly ante-natal clinics were held during the year in all the centres; each ante-natal case being given a thorough overhaul by the Medical Officer in charge, usually monthly. Suspected cases of Venereal Disease are sent to their own Doctors for Kahn test, and fortunately almost all Kahn reactions prove to be negative. There have been cases of anaemia of pregnancy due to faulty diet, out of 358 new cases of this disease, 222 were vegetarian and 136 non-vegetarian.

In addition to these major events various other minor ailments were detected. Malpositions being righted by external version.

All the cases that were found having deformities of the pelvis were referred to the Hospital for confinement. Mothers needing dental treatment are also referred to their own dentists. There have been quite a few cases of albuminuria, all of which were referred to Hospital.

The general view of the health of the expectant mother was watched by home visiting, and by repeated visits to the clinic.

### Midwives.

The midwives in private practice in Nairobi co-operate to a considerable extent with the clinics, and during the year have taken full advantage of the clinics' facilities. Most of them bring all their primipara cases and difficult or doubtful multipara cases to the clinics for examination.

### Dais.

The essential thing here is instructive and careful supervision of the dais. They themselves are willing to co-operate and willing to learn. Weekly classes were held during the year.

### Post-Natal Work.

Not very popular yet but it is hoped that as soon as some post-natal exercises are introduced in each of the centres some more enthusiasm may be aroused.

### Child Welfare.

The remarks made above under home visiting apply with equal force to the visiting of the new born, which is to a great extent dependent on early and efficient notification of births by the midwives and dais.

The notification of births in the town is still defective, however, as there are some untrained dais or handy women practising who do not fully realise the importance of prompt and accurate notification of births.

In addition to visiting the newly born, weekly clinics are held for infants and toddlers whose general health often has to be overhauled, periodically, by the Medical Officer. As regards infants, special care is taken to do test feeds.

Time tables for toddlers feeds are planned by the Health Visitors. Milk was distributed in all three centres and appears to be much appreciated at the Sandeford Road and Pangani centres, although, for some as yet undetermined reason, not at the Ngara clinic.

Sewing classes were held and demonstrations of food preparation given at Pangani.

### Medical Aspects.

There have been cases of typhoid, dysentery, measles, chickenpox, whooping-cough, pneumonia and a few cases of infantile paralysis among the clinic children. Malaria was prevalent to some extent during the year.

The few cases noted of infantile paralysis were sporadic and had no obvious link with each other. The disease is noted again amongst the European school children on page 20.

## Vaccinations and Innoculations.

| Centre. | Vaccinations. | T.A.B. Inoculations. |
|---|---|---|
| Ngara ... ... ... | 222 | 23 |
| Sandeford Road ... ... | 132 | Nil |
| Pangani ... ... ... | 273 | 133 |
| Total ... ... ... | 627 | 156 |

Unfortunately the reaction to the T.A.B. inoculation is so severe that very few patients return for their second dose. At the end of the year a fresh vaccine was obtained, in this case a alcoholised vaccine which, on a preliminary test, does not appear to have so severe a reaction.

It is hoped that before long the need for undergoing T.A.B. inoculation will be more appreciated.

## Miscellaneous Activities.

The services of the Health Visitors are much in demand. Throughout the town requests have been coming in to give lectures to various Women's Associations and to schools. In addition to these outside lectures classes were held at the centres continuously throughout the year on home nursing, first aid and mothercraft.

There is much eagerness among Asian women to search for knowledge and they are very willing to co-operate. The popularity of the Women's Associations, Girls Associations and Nursery Schools at Sandeford Road and the Women's Association and Children's Club at Pangani shows the willingness of the women to learn all there is to know about children and much health teaching has been done through these associations.

## ASIAN MATERNITY AND CHILD WELFARE.

| Clinics. | | Ngara Rd. | Sandeford Rd. | Pangani. | 1943. | 1944. | 1945. | 1946. | 1947. | Per cent increase or decrease in year. |
|---|---|---|---|---|---|---|---|---|---|---|
| **Antenatal.** | | | | | | | | | | |
| Number held | ... | 52 | 52 | 50 | | | | | | |
| New cases | ... | 636 | 70 | 326 | | 669 | 839 | 1074 | 1032 | 3.9 |
| Total attendances | ... | 2438 | 454 | 1129 | 2652 | 2602 | 3249 | 3560 | 4021 | 12.0 |
| **Child Welfare.** | | | | | | | | | | |
| Number held | ... | 51 | 53 | 49 | | 376 | 586 | 838 | 722 | 13.8 |
| New cases | | | | | | | | | | |
| (Infants 0·1 year) | ... | 396 | 98 | 239 | | | | | | |
| (Todlers 1·5 years) | ... | 100 | 80 | 149 | | 144 | 402 | 579 | 329 | 25.9 |
| Total attendances | ... | 3456 | 1797 | 3059 | 4064 | 4131 | 6000 | 7661 | 8311 | 8.5 |
| **Home Visits.** | | | | | | | | | | |
| By Health Visitors | ... | 1958 | 1975 | 2773 | | 2755 | 2755 | 5573 | 6716 | 20.5 |
| By Health Assistants | ... | 1174 | 1248 | 1047 | | 1204 | 1875 | 2717 | 3469 | 27.7 |
| Total | ... | 3132 | 3223 | 3820 | | 3979 | 4630 | 8290 | 10185 | 22.9 |
| **Dispensary** | ... | 628 | 430 | 671 | 565 | 833 | 892 | 1646 | 1729 | 5.0 |

## VENEREAL DISEASES.

During the first part of the year the treatment and medical supervision at the V. D. Clinic was in the care of Dr. M. G. Robson acting as locum for Dr. Hunter. Dr. Hunter returned from overseas leave in Britain during the third week in August, where she had attended a refresher course in Venereal Diseases.

It will be noticed that there has been an increase of 57% in the number of consultations at the clinic and an increase of 80% in the number of new patients with syphilis whilst the corresponding gonorrhoea figure has remained about the same. This increase in the ratio between Syphilis and Gonorrhoea may be partly due to some trend in the psychology of the V.D. patient, possibly related to pain, or overt ulceration which may cause the syphilis sufferer to be more ready to come, than the sufferer from gonorrhoea. But even allowing for this fact the disparity is very wide and is comparable with a similar trend observable in the venereal diseases attendances in South Africa as a whole, where taking all races together there were approximately twice as many attendances for syphilis as for gonorrhoea in 1937, whilst in 1945, though the gonorrhoea attendances had not altered, there were now about five and a half times as many patients with syphilis.

The 57% increase in total consultations is reflected in a very marked degree in the overcrowding every forenoon at the little building in Pumwani, which was designed to cater for about one-third of the number of sufferers which it has had to accomodate this year. It is an interesting reflection and a sobering thought that approximately half of all the African women in Nairobi attended the clinic as fresh cases during the year.

It is always a considerable disappointment with V.D. work that so many people fail to complete the course and this is even more marked in an African community where women only come to the towns for short periods either on account of Venereal diseases, or because they expect a child, or want to return for a time to their husbands who work in the towns. They go back to the Reserves half cured and some have been found to return a year or so later with their Venereal diseases in a much worse state. In order to some extent to improve the prospect of these people on their return to the Reserves a card has been evolved one part of which can be given to the woman concerned and the other sent through the Medical Department to the Medical Officer of the Reserve showing what treatment has been given and what measures are suggested to complete the course.

## SUMMARY OF CLINIC WORK.

### 1. Attendance.

| | | Per cent Increase or decrease on 1946 |
|---|---|---|
| Number of consultations ... ... ... ... | 20,605 | 57.3 |
| Number of treatments ... ... ... ... | 7,276 | 24.7 |
| Number at gynæcological clinic ... ... ... | 1,140 | 113.1 |
| Total attendance ... ... ... ... ... | 29,021 | 23.9 |

Number of clinics ... 254. Average attendance per clinic ... 81.

### 2. Consultations.

| | | |
|---|---|---|
| By patients with Syphilis ... ... ... ... | 11,116 | |
| By patients with Gonorrhoea ... ... ... ... | 2,614 | |
| By patients with Yaws ... ... ... ... ... | 141 | |
| Total by patients with V.D. ... ... ... ... | 13,871 | 44.0 |
| By other patients ... ... ... ... ... | 6,734 | |
| Total consultations ... | 20,605 | 57.3 |

### 3. Case Analysis.

| | |
|---|---|
| Number of old cases from 1944 ... ... ... | 1 |
| „ 1945 ... ... ... | 29 |
| „ 1946 ... ... ... | 389 |
| Number of new cases in 1947 ... ... ... | 4024 |
| Total under treatment ... | 4443 |

Type of case:—

| Disease. | Old cases | New cases | Total |
|---|---|---|---|
| Syphilis, Primary ... ... | 1 | 24 | 25 |
| „ Secondary ... ... | 31 | 186 | 217 |
| „ Latent ... ... | 160 | 652 | 812 |
| „ Tertiary ... ... | 2 | 11 | 13 |
| „ Congenital ... ... | 27 | 109 | 136 |
| Total Syphilis ... | 221 | 982 | 1203 |
| Gonorrhœa ... ... ... | 70 | 458 | 528 |
| Yaws ... ... ... | 4 | 28 | 32 |
| Total V.D. ... | 295 | 1468 | 1763 |
| Other cases ... | 124 | 2556 | 2680 |
| Total all diagnoses ... | 419 | 4024 | 4443 |

### 4. Injections Given.

| | |
|---|---|
| Intravenous (N.A.B.) ... ... ... ... ... | 6,065 |
| Intramuscular— | |
| Bismuth and Acetylarsan ... ... ... ... | 5,520 |
| Penicillin ... ... ... ... ... ... | 1,505 |
| Total ... | 13,090 |

### 5. Specimens Taken for Laboratory Test.

| Type | Result | | |
|---|---|---|---|
| Specimens for Kahn Test. | Positive | Doubtful | Negative |
| 5,842 | 1,610 | 407 | 3,825 |

Smears for Gonococcal examination.

| | | |
|---|---|---|
| Taken from urethra ... ... ... | 4,502 | number positive 77 |
| „ „ cervix ... ... ... | 4,352 | „ „ 114 |
| „ „ vagina ... ... ... | 35 | „ „ 4 |
| „ „ Bartholin's glands ... ... | 10 | „ „ — |
| „ „ eye ... ... ... | 41 | „ „ 10 |
| Total ... | 9,031 | Total 205 |

### 6. Home Visits to V.D. Patients.

| | |
|---|---|
| Number of home visits paid ... ... ... | 1884 |
| Patients contacted ... ... ... ... | 1024 times |
| Returned to clinic after being contacted ... ... | 442 patients (43 per cent) |

### 7. Women Prisoners from the Jail.

| | |
|---|---|
| Number referred for examination ... ... ... | 13 |
| Number found to be infected ... ... ... ... | 10 (77 per cent) |
| With syphilis | 8 |
| With gnnorrhœa | 2 |

### 8. Examination of Ayahs referred by their Employers.

| | |
|---|---|
| Number referred for examination ... ... ... | 31 |
| Number found to be infected ... ... ... ... | 15 (50 per cent) |
| With syphilis | 12 |
| With gonorrhœa | 3 |

### 9. Examination of Pregnant Women referred by Maternity Hospital and by Ante-Natal Clinics.

| | |
|---|---|
| Number examined ... ... ... ... ... | 1949 |
| Number infected ... ... ... ... ... | 626 (32 per cent) |
| With syphilis | 327 |
| With gonorrhœa | 267 |
| With both SY & GC | 31 |
| With Yaws | 1 |

# STAFF.

**Medical Officer of Health.**

A. T. G. Thomas, M.D., B.S. (Durham), D.P.H. (London).

**Deputy Medical Officer of Health.**

L. S. Anderson, B.Sc. (Edin), M.B., Ch.B. (Manc), D.P.H. (Edin).

**Medical Officer-in-Charge, African Child Welfare.**

Mary Graham-Johnstone, M.B., Ch.B. (Edin) (until May).
Jessie A. T. Henry, M.B., Ch.B. (Edin), D.T.M. & H. (May onwards).

**Medical Officer-in-Charge, Asian Child Welfare.**

Soushilla Soule, M.B., B.S. (Punjab) (until March).
Anjna Vohra, M.B., B.S. (May to October).
Margaret E. B. Bax, M.B., Ch.B., L.R.C.P. and M.R.C.S., (December).

**Medical Officer-in-Charge, Venereal Diseases Clinic.**

Louise O. Hunter, M.R.C.S. (Eng.), L.R.C.P. (London).
Marcia G. Robson, M.B., Ch.B. (Glasgow), (Locum to Dr. Hunter until August).

**Senior Sanitary Inspector.**

Mr. R. C. Forster, Cert: R.S.I. & Meat.

**Sanitary Inspectors.**

Mr. D. Mackintosh, Cert: S.A.S.
Mr. S. White, Cert: R.S.I.
Mr. P. Cairns, Cert: R.S.I.
Mr. A. Ramshaw, Cert: R.S.I. and Meat.
Mr. A. A. Watts, Cert: R.S.I. and Meat.
Mr. R. D.Belsare, Cert: R.S.I. (India).
Mr. I. L. Wareham (Trainee).
Mr. R. Hewitt, (March and April).
Five African Health Assistants.

**Inspector of Foods.**

Mr. H. T. Beechey, Cert: R.S.I. and Meat also Dip: R.I.P.H.H. (Hons).

**Clerical Staff.**

Stenographers:

Mrs. D. Critchley. (January to March).
Miss M. Pardoe. (March to September).
Miss J. M. Atkins. (November onwards).

Clerks:

Mrs. B. V. Lawson. (January to May).
Miss P. Humphreys. (February to June).
Mrs. E. Dallwood. S.R.N. (June to December).
Mrs. D. Butcher, (July onwards).

**Infectious Diseases Control Department.**

Municipal Entomological Officer.
Mr. G. R. Cunningham van Someren, F.R.E.S.

Mosquito Inspectors.
Mr. H. G. Bilcliffe.
Mr. A. Gocs.
Mr. Abdul Karmali.
Mr. D. C. Klynsmith. (January to November).
Mr. H. G. Clarke. (January to March).
Mr. C. C. Cridland. (January to July).
Mr. F. S. Cowburn. (September to December).

Rodent Officer.
Mr. J. Morrill. (Transferred from Mosquito Inspectors March to December).

Typist and Dispenser.
Mrs. Sullivan, S.R.N.

African Vermin Overseer.
Mr. H. Nelson Obiero. (January to May).
Mr. James Karebe. (May to December).

Laboratory Assistant.
African Assistant, William Ongare.

**African Maternity and Child Welfare Clinics.**

Supervisor of Health Visitors:—
Mrs. E. T. Dugmore. S.R.N. C.M.B.

Health Visitors:—

Mrs. A. Gibb. C.M.B.
Mrs. J. C. Brooks. S.R.N. C.M.B.
Mrs. C. M. Davis. S.R.N. C.M.B.
Mrs. J. Rowe. S.R.N. C.M.B.
Mrs. A. Davies. (Until November).
Miss J. Lorimer. S.R.N. C.M.B. H.V.Cert. (April onwards)
and fifteen African Clinic Assistants.

**Asian Maternity and Child Welfare Clinics.**

Health Visitors:

Miss Priscilla Benjamin.
Mrs. S. D. Bhaskare.
Mrs. S. Chadda.

**Clinic Assitants:**

Miss Jena Sidi Mohamed.
Miss Khanshalia Sood.
Miss Kurshid Ramzan.
Miss Olive Fernandes.

**Lady Grigg Maternity Hospital.**

Medical Officer-in-Charge: Aileen Williams, M.R.C.S., L.R.C.P.
Matron: Miss K. M. Foord. S.R.N. C.M.B.
Nursing Sisters:

Miss M. Francis. S.R.N. C.M.B.
Miss E. M. Weigert, S.R.N. C.M.B.
Miss J. Lorimer. S.R.N. C.M.B. (Until March).

**Venereal Diseases Clinic.**

Mrs. M. Humphreys. S.R.N.
Mrs. E. Jarvis. S.R.N. (Until April).
Mrs. P. Graham. S.R.N. (April onwards).

**Cleansing Department.**

Cleansing Superintendent: Mr. R. A. McDonell, M. Inst. P.C. (on leave March to September).
Deputy Cleansing Superintendent:

Mr. T. E. Davies, (Act a C.S. March to Sept.).
Mr. T. Pienaar, Overseer i|c. Conservatory Section.
Mr. A. Savy, Overseer i|c. Refuse Removal, Public Conveniences and Sweeper Service.
Mr. A. Rozaner, Overseer i|c. Street Cleansing Services.
Mr. P. Visser, Asst. Overseer—Conservancy.
Mr. J. Kloppers, Asst. Overseer—Conservancy. (June and July)
Mr. G. L. Bryant, Asst. Overseer, Street Cleansing. (July to October).
Mr. W. G. Adeline, Asst. Overseer—Refuse Removal. (July to November).
Mr. A. Keller, Engineer i|c. Incinerator. (Feb. to November).
Mr. L. H. Clough, Asst. Overseer—Refuse Removal. (October onwards).
Mr. J. D. Jules. Absent on Military Service throughout the year.
General Clerk Grade III: Miss D. M. Ewing.

# EXPENDITURE.

## PUBLIC HEALTH DEPARTMENT:

| | £ | s. | cts. | £ | s. | cts. |
|---|---|---|---|---|---|---|
| Salaries: | | | | | | |
| Medical Officer of Health ... ... ... | 1,427 | 15 | 49 | | | |
| Deputy Medical Officer of Health ... ... | 734 | 11 | 05 | | | |
| Sanitary Inspectors ... ... ... | 5,445 | 17 | 57 | | | |
| Clerical Staff ... ... ... | 288 | 10 | 09 | | | |
| Cost of Living Allowances ... ... ... | 651 | 10 | 07 | | | |
| Provident Fund ... ... ... | 453 | 11 | 17 | | | |
| African Sanitary Inspectors Salaries ... ... | 551 | 17 | 29 | | | |
| Wages, etc: Messengers ... ... ... | 279 | 11 | 98 | | | |
| Uniforms ... ... ... ... | 31 | 13 | 60 | | | |
| Rent of Offices ... ... ... ... | 500 | 00 | 00 | | | |
| Printing, Stationery and Advertising ... ... | 810 | 00 | 00 | | | |
| Telephone ... ... ... ... | 55 | 2 | 18 | | | |
| Locomotion and Transport ... ... ... | 425 | 2 | 54 | | | |
| Passage Expenses—New Appointments ... ... | 279 | 11 | 25 | | | |
| Food and Drug Analysis—Fees ... ... | 284 | 15 | 78 | | | |
| Laboratory—Maintenance and Equipment ... | 8 | 8 | 78 | | | |
| Public Health Propaganda ... ... ... | 49 | 3 | 63 | | | |
| Postages ... ... ... ... | 147 | 17 | 00 | | | |
| Conference Expenses ... ... ... | 75 | 4 | 00 | | | |
| Miscellaneous ... ... ... ... | 36 | 13 | 25 | | | |
| | | | | 12,537 | 16 | 76 |

## Infectious Diseases Prevention:

| | £ | s. | cts. | £ | s. | cts. |
|---|---|---|---|---|---|---|
| Salaries: | | | | | | |
| Entomological Officer ... ... ... | 663 | 6 | 60 | | | |
| Mosquito Inspectors ... ... ... | 2,381 | 9 | 48 | | | |
| Clerk ... ... ... ... | 390 | 3 | 39 | | | |
| Cost of Living Allowances ... ... ... | 630 | 2 | 65 | | | |
| Provident Fund ... ... ... ... | 214 | 13 | 88 | | | |
| Wages, etc: Native Staff ... ... ... | 5,205 | 8 | 24 | | | |
| Uniforms ... ... ... ... | 296 | 11 | 57 | | | |
| Oil and General Stores ... ... ... | 1,969 | 10 | 51 | | | |
| Transport ... ... ... ... | 2,481 | 3 | 17 | | | |
| Rent of Store ... ... ... ... | 25 | 0 | 00 | | | |
| Laboratory Equipment ... ... ... | 3 | 4 | 27 | | | |
| Printing, Stationery and Advertising ... ... | 56 | 6 | 00 | | | |
| Telephone ... ... ... ... | 17 | 3 | 06 | | | |
| Miscellaneous Expenses ... ... ... | 17 | 17 | 15 | | | |
| Vaccination and Inoculation Expenses ... ... | 9 | 16 | 43 | | | |
| Hospital Fees ... ... ... ... | 1,432 | 18 | 00 | | | |
| Notification Fees ... ... ... ... | 44 | 14 | 00 | | | |
| Capital Expenditure from Revenue. Cyanide Store | 130 | 1 | 90 | | | |
| | | | | 15,969 | 10 | 30 |

## Venereal Disease:

| | £ | s. | cts. | £ | s. | cts. |
|---|---|---|---|---|---|---|
| Salaries: | | | | | | |
| Medical Officer ... ... ... ... | 915 | 4 | 15 | | | |
| Locum Medical Officer ... ... ... | 253 | 4 | 52 | | | |
| Clinic Sisters ... ... ... ... | 594 | 7 | 95 | | | |
| Cost of Living Allowances ... ... ... | 193 | 19 | 20 | | | |
| Provident Fund Contribution ... ... ... | 89 | 6 | 88 | | | |

| | £ | s. | cts. | £ | s. | cts. |
|---|---|---|---|---|---|---|
| Wages, etc: Native Staff ... ... ... | 284 | 6 | 18 | | | |
| Uniforms ... ... ... ... | 28 | 11 | 04 | | | |
| Locomotion and Travelling ... ... ... | 49 | 18 | 22 | | | |
| Repairs to Buildings ... ... ... | 57 | 3 | 89 | | | |
| Repairs and Renewals of Furniture ... ... | 15 | 2 | 61 | | | |
| Medical Stores and Equipment ... ... | 159 | 19 | 36 | | | |
| Water, Sanitation and Cleaning Materials ... | 15 | 8 | 41 | | | |
| Printing, Stationery and Advertising ... ... | 30 | 2 | 00 | | | |
| Miscellaneous ... ... ... ... | 27 | 8 | 00 | | | |
| | | | | 2,714 | 2 | 39 |

**Maternity and Child Welfare:**

| | £ | s. | cts. | £ | s. | cts. |
|---|---|---|---|---|---|---|
| Salaries: | | | | | | |
| Lady Medical Officers ... ... ... | 1,208 | 3 | 60 | | | |
| Health Visitors ... ... ... | 3,893 | 19 | 25 | | | |
| Cost of Living Allowances ... ... ... | 523 | 9 | 00 | | | |
| Provident Fund ... ... ... ... | 209 | 9 | 58 | | | |
| Locomotion Allowances ... ... ... | 539 | 12 | 44 | | | |
| Wages, etc: Native Ayahs and Dressers ... | 756 | 6 | 17 | | | |
| Uniforms ... ... ... ... | 130 | 16 | 39 | | | |
| Overseas Appointments—Passages ... ... | 6 | 0 | 16 | | | |
| Maintenance of Clinics ... ... ... | 66 | 3 | 18 | | | |
| Furniture Repairs and Renewals ... ... | 167 | 13 | 00 | | | |
| Medical Stores and Infant Food ... ... | 1,316 | 14 | 29 | | | |
| Surgical and Medical Equipment ... ... | 157 | 18 | 89 | | | |
| Rent of Clinics ... ... ... ... | 82 | 4 | 00 | | | |
| Cleaning Materials ... ... ... | 63 | 5 | 00 | | | |
| Electricity ... ... ... ... | 62 | 13 | 40 | | | |
| Fire Insurance ... ... ... ... | 14 | 2 | 20 | | | |
| Water and Conservancy ... ... ... | 31 | 4 | 90 | | | |
| Printing, Stationery and Advertising ... ... | 151 | 10 | 08 | | | |
| Telephones ... ... ... ... | 22 | 1 | 00 | | | |
| Baby Show ... ... ... ... | 20 | 11 | 40 | | | |
| Miscellaneous Expenses ... ... ... | 40 | 19 | 77 | | | |
| | | | | 9,464 | 17 | 70 |

**Lady Grigg Maternity Hospital:**

| | £ | s. | cts. | £ | s. | cts. |
|---|---|---|---|---|---|---|
| Salaries: | | | | | | |
| Lady Superintendent ... ... ... | 817 | 14 | 17 | | | |
| Matron ... ... ... ... | 442 | 9 | 88 | | | |
| Nursing Sisters ... ... ... ... | 759 | 17 | 13 | | | |
| Housekeeper ... ... ... ... | 271 | 18 | 85 | | | |
| Cost of Living Allowances ... ... ... | 219 | 12 | 98 | | | |
| Provident Fund ... ... ... ... | 148 | 0 | 00 | | | |
| Medical Fees—Locums ... ... ... | 226 | 5 | 66 | | | |
| Locomotion and Transport ... ... ... | 218 | 18 | 34 | | | |
| Passages Expenses—New Appointments ... | 162 | 9 | 00 | | | |
| Wages, etc: Household Staff ... ... ... | 412 | 6 | 85 | | | |
| Wages, etc: Nursing Staff ... ... ... | 907 | 13 | 39 | | | |
| Uniforms ... ... ... ... | 159 | 19 | 71 | | | |
| Medical Stores and Equipment ... ... | 579 | 7 | 12 | | | |
| Linen, Cutlery and Crockery ... ... ... | 177 | 18 | 76 | | | |
| Provisions ... ... ... ... | 601 | 14 | 23 | | | |
| Maintenance of Buildings ... ... ... | 80 | 15 | 95 | | | |
| Furniture Repairs and Renewals ... ... | 89 | 1 | 80 | | | |
| Cleaning Materials ... ... ... | 82 | 5 | 31 | | | |

| | £ | s. | cts. | £ | s. | cts. |
|---|---|---|---|---|---|---|
| Printing, Stationery and Advertising ... ... | 102 | 15 | 23 | | | |
| Telephone ... ... ... ... | 45 | 8 | 59 | | | |
| Electricity and Fuel ... ... ... ... | 213 | 5 | 61 | | | |
| Water and Sanitation ... ... ... ... | 79 | 12 | 00 | | | |
| Fire Insurance ... ... ... ... | 10 | 19 | 49 | | | |
| Rent of Annexe and Miscellaneous ... ... | 15 | 12 | 08 | | | |
| Renewals Reserve ... ... ... ... | 200 | 0 | 00 | | | |
| Capital Expenditure from Revenue Furniture, Septic Ward and New Nurses Quarters ... | 897 | 4 | 94 | | | |
| Loan Charges ... ... ... ... | 177 | 5 | 76 | | | |
| | | | | 8,100 | 12 | 83 |
| Total Expenditure ... | | | | 48,786 | 19 | 98 |

**Revenue from Public Health Department:**

| | £ | s. | cts. | £ | s. | cts. |
|---|---|---|---|---|---|---|
| Government Grant to Public Health ... ... | 21,000 | 0 | 00 | | | |
| Sundry Receipts ... ... ... ... | 7 | 15 | 50 | | | |
| Infectious Diseases Dept: (Vermin Destruction) | 72 | 17 | 75 | | | |
| Maternity and Child Welfare Dept: (Sundry Revenue) ... ... ... | 56 | 17 | 34 | | | |
| Lady Grigg Maternity Hospital: (Fees) ... | 855 | 11 | 70 | | | |
| ,, ,, Native Trust Fund Grant ... | 250 | 0 | 00 | | | |
| ,, ,, Local Native Council Grant ... | 145 | 0 | 00 | | | |
| ,, ,, Miscellaneous ... ... | 8 | 16 | 80 | | | |
| Total Revenue ... | | | | 22,396 | 19 | 09 |
| Balance Charged to Rates ... | | | | 26,390 | 0 | 89 |

**Cleansing Department:**

**Night Soil Removal:**

| | £ | s. | cts. | £ | s. | cts. |
|---|---|---|---|---|---|---|
| Wages, etc: and Labour ... ... ... | 3,003 | 13 | 12 | | | |
| Uniforms ... ... ... ... | 91 | 10 | 63 | | | |
| Mechanical Vehicles—running costs ... ... | 7,053 | 1 | 86 | | | |
| Lamps and Oil ... ... ... ... | 137 | 10 | 23 | | | |
| General Stores ... ... ... ... | 57 | 15 | 63 | | | |
| Buckets ... ... ... ... | 257 | 9 | 40 | | | |
| Maintenance of Buildings ... ... ... | 130 | 7 | 74 | | | |
| Ox Transport ... ... ... ... | 139 | 10 | 35 | | | |
| | | | | 10,870 | 18 | 96 |

**Cleansing Station:**

| | £ | s. | cts. | £ | s. | cts. |
|---|---|---|---|---|---|---|
| Wages, etc: and Labour ... ... ... | 692 | 11 | 81 | | | |
| Electricity ... ... ... ... | 167 | 4 | 20 | | | |
| Upkeep of Buildings and Pumps ... ... | 29 | 10 | 78 | | | |
| Water and Conservancy ... ... ... | 208 | 9 | 07 | | | |
| Renewals Reserve ... ... ... | 125 | 0 | 00 | | | |
| Salaries, Allowances and Other Charges of Cleansing Superintendent and Staff ... | 1,747 | 4 | 92 | | | |
| Stores and Workshop Expenses ... ... | 300 | 0 | 00 | | | |
| Administration Expenses (Proportion) ... | 2,600 | 0 | 00 | | | |
| Loan Charges ... ... ... ... | 139 | 15 | 26 | | | |
| | | | | 6,003 | 16 | 04 |

| | £ | s. | cts. | £ | s. | cts. |
|---|---|---|---|---|---|---|
| **Refuse Removal:** | | | | | | |
| Wages, etc: Labour ... ... ... ... | 2,417 | 13 | 71 | | | |
| Uniforms ... ... ... ... | 366 | 15 | 91 | | | |
| Mechanical Vehicles—Running Expenses ... | 6,707 | 19 | 25 | | | |
| General Stores ... ... ... ... | 13 | 6 | 00 | | | |
| Dustbins ... ... ... ... | 313 | 9 | 12 | | | |
| | | | | 9,869 | 3 | 99 |
| **Destructors:** | | | | | | |
| Wages: ... ... ... ... | 633 | 16 | 46 | | | |
| Repairs and Maintenance ... ... ... | 276 | 4 | 39 | | | |
| Electricity ... ... ... ... | 44 | 3 | 74 | | | |
| Water and Sanitation Charges ... ... | 69 | 18 | 74 | | | |
| General Stores ... ... ... ... | 17 | 0 | 88 | | | |
| Fire and Boiler Insurance ... ... ... | 10 | 14 | 72 | | | |
| Renewals Reserve ... ... ... | 500 | 0 | 00 | | | |
| Loan Charges ... ... ... ... | 372 | 19 | 60 | | | |
| | | | | 1,955 | 11 | 78 |
| **Tipping:** | | | | | | |
| Wages ... ... ... ... ... | 816 | 9 | 01 | | | |
| Other Charges ... ... ... ... | 53 | 12 | 60 | | | |
| Salaries and Allowances of Superintendent and Staff ... ... ... ... | 1,492 | 9 | 28 | | | |
| Administration Expenses (Proportion) ... | 950 | 0 | 00 | | | |
| Stores and Workshops Expenses (Proportion)... | 300 | 0 | 00 | | | |
| | | | | 3,612 | 10 | 89 |
| **Scavenging:** | | | | | | |
| Wages ... ... ... ... ... | 5,913 | 13 | 61 | | | |
| Uniforms ... ... ... ... | 538 | 15 | 61 | | | |
| Mechanical Vehicles—Running Costs ... ... | 106 | 3 | 75 | | | |
| Brushes, Equipment and General Stores ... | 480 | 11 | 66 | | | |
| Ox Transport ... ... ... ... | 280 | 7 | 89 | | | |
| Street Orderlies ... ... ... ... | 266 | 6 | 10 | | | |
| Miscellaneous ... ... ... ... | 8 | 8 | 69 | | | |
| Plot Cleansing ... ... ... ... | 28 | 16 | 32 | | | |
| Stores and Workshop Expenses ... ... | 150 | 0 | 00 | | | |
| Salaries, Allowances and Other Charges Superintendent and Staff ... ... | 994 | 19 | 52 | | | |
| Administration Expenses (Proportion) ... ... | 225 | 0 | 00 | | | |
| | | | | 8,993 | 3 | 15 |
| **Public Conveniences:** | | | | | | |
| Wages (including Sweepers) ... ... ... | 3,901 | 11 | 43 | | | |
| Uniforms ... ... ... ... | 332 | 14 | 22 | | | |
| Stores and Disinfectants ... ... ... | 422 | 10 | 78 | | | |
| Maintenance of Buildings ... ... ... | 147 | 16 | 45 | | | |
| Water and Sanitation Charges ... ... | 1,163 | 7 | 51 | | | |
| Reserve for Renewals ... ... ... | 150 | 0 | 00 | | | |
| Stores and Workshops Expenses (Proportion) | 75 | 0 | 00 | | | |
| Loan Charges ... ... ... ... | 237 | 18 | 51 | | | |
| Salaries Allowances and Other Charges Superintendent and Staff ... ... | 497 | 9 | 76 | | | |
| Administration Expenses (Proportion) ... | 225 | 0 | 00 | | | |
| | | | | 7,153 | 8 | 66 |
| Total Cleansing Expenditure ... | | | | 48,458 | 13 | 47 |

## CLEANSING DEPARTMENT. REVENUE.

| | £ | s. | cts. | £ | s. | cts. |
|---|---|---|---|---|---|---|
| Night Soil Removal (Fees and Charges) ... | 17,254 | 0 | 78 | | | |
| Emptying Septic Tanks ... ... ... | 1,939 | 5 | 14 | | | |
| Refuse Removal (Sundry Charges) ... ... | 355 | 5 | 31 | | | |
| Dustbins ... ... ... ... | 265 | 14 | 25 | | | |
| Steam (Sale of, to By-Products Plant) ... ... | 304 | 0 | 00 | | | |
| Scavenging (Sundry Charges) ... ... | 165 | 16 | 80 | | | |
| Public Conveniences (Receipts from Sweeper Service) ... ... ... ... | 3,403 | 1 | 00 | | | |
| Total Revenue ... | | | | 23,687 | 3 | 28 |
| Balance Charged to Rates ... | | | | £24,771 | 10 | 19 |

# PUBLIC HEALTH DEPARTMENT